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The potential and the limits of mindfulness:

When and for whom is it beneficial?

A thesis

submitted in fulfilment

of the requirements for the degree

of

Doctor of Philosophy in Psychology

at

The University of Waikato

by

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THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

2021

Abstract

Mindfulness is an inherent human capacity that is characterised as present moment awareness while maintaining an accepting and nonjudgmental stance. Mindfulness is related to better self-regulation and it enables individuals to refrain from behaviour that is driven by automaticity and impulsivity. While this is a capacity that can be beneficial in many jobs, we do not fully understand the work situations in which mindfulness may be helpful or the conditions under which mindfulness-based interventions (MBIs) improve critical outcomes such as mental health and performance. Research investigating the potential and limits of mindfulness in today's challenging world is therefore warranted.

This thesis set out to examine mindfulness in various contexts to investigate its potential mental health and performance benefits across different populations (N=564) distributed over five different studies. These five studies involved three different samples including employees (n=301), youth (n=239) and trainees (n=24). Cross-sectional survey designs and experimental intervention studies were used to investigate when and for whom mindfulness is beneficial. Hierarchical and stepwise multiple regression analyses, an ANCOVA and the Wilcoxon-signed rank test were applied to analyse data.

It was found that mindfulness can help to buffer the negative effect of inauthenticity on depression in a sample of employees. Furthermore, more mindful employees showed a higher readiness for change in times of organisational change, but only when levels of well-being are high and distress is low. Having established that mindfulness can be beneficial in the workplace, it was investigated whether low-dose MBIs are effective in enhancing mental health and attentional performance. It was found that a low-dose-MBI could protect from performance decline in times of demanding training with positive effects on well-being at follow-up. Moreover, a low-

dose MBI alleviated distress, but only for those who had higher levels of mindfulness and well-being at baseline. Finally, the contribution of different mindfulness facets to well-being and distress was investigated. The results demonstrated that the mindfulness facet Nonreacting was the main predictor of well-being, while the facet Acting with awareness was the main inverse predictor of distress.

Overall, the findings of this thesis show that mindfulness can help employees to deal with demands at work, such as organisational change, and it can enhance well-being and reduce distress. However, mindfulness may not be beneficial under all conditions and for everyone. Organisations who aim to use interventions should carefully assess employees' current levels of mindfulness and well-being to assign them to the right intervention format.

Acknowledgements

First, I would like to thank my supervisors Dr. Anna Sutton and Dr. Oleg Medvedev. I would not have been able to get to this point without you. Anna, I am grateful beyond words for your consistent and unconditional support throughout my studies. Thank you so much for guiding me through the various challenges of doctoral research. You have always been a great source of encouragement and advice, which made me feel confident in myself and optimistic about the end goal. Oleg, thank you so much for your ongoing motivation, great ideas and for challenging my analytical thinking skills. I truly believe I learned a lot over the course of my studies.

I would also like to thank Carsten Grimm and the New Zealand Defence Force for giving me the opportunity to conduct research with them. The collaboration with you has been a huge privilege and invaluable for my doctoral research.

Jess and Ryan, thank you for always patiently and empathetically listening to me, cheering me up, celebrating successes and going on adventures with me. You make New Zealand feel like home to me. Maddie, thank you for being my fellow PhD companion. It is great to have someone to share the experience with, including all the ups and downs. To my family, thank you for being so supportive of my educational journey. I really appreciate that you always supported my studies and my learning so far away from home.

Finally, I would like to thank the University of Waikato for giving me the opportunity to study here and for supporting me through the Doctoral Scholarship.

I would also like to thank Gary Ferguson who proofread my chapters.

Table of Contents

Abstract.....	i
Acknowledgements	iii
Table of Contents	iv
List of Publications from this Thesis	v
Chapter One: General Introduction	1
Chapter Two: Mindfulness and Inauthenticity	28
Chapter Three: Mindfulness and Readiness for Change	43
Chapter Four: Effectiveness of a Low-dose Mindfulness-based Intervention on Attentional Performance and Well-being	68
Chapter Five: Effectiveness of a Low-dose Mindfulness-based Intervention on Distress	88
Chapter Six: Differential Contribution of Mindfulness Facets	98
Chapter Seven: General Discussion	107
References (Chapter 1 and 7)	130
Appendix: Publication Co-Authorship Forms	147

List of Publications from this Thesis

Peer-reviewed journal articles reproduced in this thesis with permission from the publishers

Roemer, A., Sutton, A., & Medvedev, O. N. (2021). Mindfulness buffers the effect of inauthenticity on depression. *Psychological Reports*. Online First.

<https://doi.org/10.1177/00332941211012941> [Impact factor: 1.53]

Roemer, A., Sutton, A., & Medvedev, O. N. (2021). The role of dispositional mindfulness in employee readiness for change during the COVID-19 pandemic.

Journal of Organizational Change Management. Online First.

<https://doi.org/10.1108/JOCM-10-2020-0323> [Impact factor: 0.96]

Roemer, A., Sutton, A., Grimm, C., Kimber, S., & Medvedev, O. N. (in preparation).

Impact of a low-dose mindfulness-based intervention on attentional performance and well-being in Navy Junior Officers.

Roemer, A., Sutton, A., Grimm, C., & Medvedev, O. N. (2021). Effectiveness of a low-dose mindfulness-based intervention for alleviating distress in young

unemployed adults. *Stress and Health*, 37(2), 320-328.

<https://doi.org/10.1002/smi.2997> [Impact factor: 2.34]

Roemer, A., Sutton, A., Grimm, C., & Medvedev, O. N. (2021). Differential

contribution of the five facets of mindfulness to well-being and psychological

distress. *Mindfulness*, 12, 693-700. <https://doi.org/10.1007/s12671-020-01535-y>

[Impact factor: 3.58]

Conference presentations

Roemer, A., Sutton, A., Grimm, C., & Medvedev, O. N. (2020). A low-dose mindfulness intervention can reduce distress for unemployed people: Findings from an employability-related training camp. *9th Aotearoa New Zealand OPOB Conference*. Conference held at the University of Canterbury, Christchurch, New Zealand.

Roemer, A., Sutton, A., Grimm, C., & Medvedev, O. N. (2020). Alleviating distress in the unemployed: Findings from a low-dose mindfulness intervention. *ALPSS Postgraduate Research Conference*. Conference held at the University of Waikato, Hamilton, New Zealand

Chapter One

General Introduction

The World Health Organization (WHO, 2021) states that an estimated 264 million people around the globe are affected by mental health disorders such as depression and anxiety. In New Zealand 18% of adults show poor mental health (Stats NZ, 2020), while one in five adults in the US experience mental illness (SAMHSA, 2019) and more than one in six adults in Europe display at least one mental health disorder (OECD/European Union, 2018). These general mental health problems could also create problems in the workplace. Research suggests that both absenteeism from work due to depression as well as presenteeism, which is work attendance despite being ill, cause substantial costs to organisations (Cocker et al., 2014). It is estimated that depression and anxiety disorders have a large global economic impact with an estimated cost of USD 1 trillion a year due to decreased productivity (WHO, 2021).

Researchers in the last decade became increasingly interested in the usefulness of mindfulness as means to lower levels of distress and enhance well-being. Mindfulness is an inherent human capacity that all individuals possess to different degrees. It is defined as conscious awareness and attention to the present moment while being accepting and nonjudgmental (Kabat-Zinn, 2003). Mindfulness enables one to observe one's sensations, feelings and thoughts rather than automatically reacting to them, which leads to greater objectivity regarding internal experiences. As a result, one has the ability and flexibility to choose how to respond to those stimuli (Shapiro et al., 2006). Meta-analyses provide empirical evidence for the effectiveness of mindfulness-based interventions (MBIs) with respect to mental health (Carmody & Baer, 2009; Virgili, 2015). Employees face many demands in the workplace that can negatively affect their mental health and reduce performance. This thesis explores the ways in which mindfulness may be able to improve these outcomes.

Recently, research has increasingly pointed to the potential and importance of a construct that is associated with better mental health, that is, authenticity. Being authentic, that is, having a high level of self-awareness and being able to express this, has been linked to higher employee well-being, engagement, workplace attitudes and behaviour (Song et al., 2020; Sutton, 2020). As a consequence, popular press, such as Forbes (Kramer, 2021; MacArthur, 2020; Travers, 2019) and the Harvard Business Review (Buote, 2016; Kouchaki, 2019; Opie & Freeman, 2017) also published articles on authenticity in the workplace on a regular basis recently. This coverage of authenticity in the workplace reached a wide audience and thus raised awareness of its importance and benefits. Employees and organisations might therefore have become interested in exploring how authenticity in the workplace can be encouraged.

While research provides sound evidence that authentic employees experience higher well-being and lower levels of stress (Sutton, 2018), qualitative research has also identified many obstacles to being authentic in the workplace (Smith & Geddes, 2018; Sutton, 2018). For instance, employees indicate that organisational culture, lack of peer and management support regarding the expression of authenticity or fears of judgment of one's authentic self, prevent them from being authentic, thus leading to feelings of inauthenticity (Smith & Geddes, 2018). Furthermore, employees say that inauthentic behaviour is motivated by the expectation to behave professionally, the desire to avoid conflict at work, and the belief that the job role requires one to hide one's authentic self (Sutton, 2018). Inauthenticity at work has been linked to mental health problems (Erickson & Wharton, 1997), which could partially contribute to the aforementioned poor mental health statistics. For this reason, the problem of employee inauthenticity at work and its negative impact on mental health has to be addressed.

Poor mental health in the workplace is concerning because stressed individuals often experience mind wandering and issues to maintain their attention (Crosswell et al.,

2020). Forty-two percent of employees struggle to focus on their tasks throughout the workday (Hougaard, 2020). Individuals who have frequently task-unrelated thoughts report higher levels of psychological distress (Stawarczyk et al., 2012) and this lack of attention may also have a negative impact on organisational performance outcomes. Consequently, addressing mental health problems alongside mind wandering is important to improve employee performance and organisational outcomes.

In addition to the global mental health crisis, the emergence of the coronavirus disease 2019 (COVID-19) pandemic has challenged the business operations of organisations and employees around the world. The fast spread of the virus forced organisations to abruptly change their work procedures, leading to problematic working conditions for many employees and contributing to a greater risk of burnout (Kniffin et al., 2020). Most organisations had to address pandemic-related challenges, such as the development of health and safety protocols, disruptions or changes to the supply chain, or changes in consumer demand, requiring the fast implementation of change (Donthu & Gustafsson, 2020). Dealing with change is not always easy for employees and in order for change to be successfully implemented, employees have to show readiness for change on an affective, cognitive and behavioural level (Bouckennooghe et al., 2009). Workplace changes due to the pandemic are therefore also a psychological challenge for employees. Not only did the pandemic change the work of many employees, many people also lost their jobs or struggled to find employment (Blustein et al., 2020), and these disruptions in employment are also known to lead to increases in mental health problems (Paul & Moser, 2009).

Considering the challenges of the COVID-19 pandemic as well as the general mental health crisis and the impact of stress on cognitive performance, it is clear that organisations have to find ways to support the mental health and performance of employees and to figure out what helps employees to deal with change at work. The

WHO (2021) estimates that for each US dollar that is invested towards the treatment of mental health disorders, organisations will see USD 4 in return reflected through enhanced employee health and productivity. Effective interventions that may help to target the outlined challenges are therefore warranted.

While the specific demands and challenges outlined above are difficult to eliminate from the workplace, one may be able to exert some control over how one responds. Mindfulness may facilitate dealing with these workplace demands because it enables an individual to observe their reactions to stressors without judgment and without responding to them impulsively. This leads to greater clarity and objectivity and gives the individual more flexibility and freedom to react in an appropriate manner (Shapiro et al., 2006). Mindfulness is related to better self-regulation (Brown & Ryan, 2003). Self-regulation involves the modulation of one's emotions, cognitions and behaviour in order to accomplish goals (Boekaerts et al., 2005). Employees who are able to regulate their emotional, cognitive and behavioural reactions through mindfulness may therefore show better psychological and performance outcomes. For example, earlier research investigated the benefits of mindfulness in organisations and found that it is positively related to job satisfaction (Andrews et al., 2014), engagement (Malinowski & Lim, 2015), affective commitment (Zivnuska et al., 2016) and creativity (Byrne & Thatchenkery, 2019). Furthermore, mindful employees are less likely to show counterproductive behaviour (Krishnakumar & Robinson, 2015) and intentions to quit (Zivnuska et al., 2016).

The introduction outlined multiple problems that employees face today. Poor mental health is prevalent throughout the world and these problems also negatively impact organisations whose employees are affected. Furthermore, employees experience additional challenges in the workplace that are associated with poor mental health, such as low feelings of authenticity at work, organisational change and cognitive

performance issues. It is therefore important to find interventions that can adequately address these problems. Mindfulness could be a possible help, but it is not fully understood who may actually benefit from it. Mindfulness' defining characteristics of nonjudgmental awareness and attention could be useful in job situations that require enhanced awareness and attentions as well as acceptance of unpleasant feelings. The overall aim of this thesis is therefore to investigate when and for whom mindfulness may be beneficial.

Mindfulness

The introduction outlined work demands and challenges employees face today. Mindfulness may help employees to reduce negative work outcomes and enhance positive work outcomes. This section will describe mindfulness and provide a comprehensive definition of the construct and its underlying mechanisms before elaborating on how mindfulness can help with challenges at work.

Mindfulness is an inherent capacity of humans, which can be defined as awareness and attention to present moment experiences in a nonjudgmental manner (Kabat-Zinn, 2003). This means that mindful individuals are able to observe internal and external stimuli without immediate interpretation (Good et al., 2016). An important mechanism of mindfulness is re-perceiving, which is “the capacity to dispassionately observe or witness the contents of one’s consciousness” (Shapiro et al., 2006, p.381). This enables individuals to perceive experiences more objectively and less reactively and allows them to see present moment experiences just as what they are. This prevents reactions that are triggered by previous experiences and thus reduces behaviour that is driven by automaticity, impulsivity and maladaptive habits, which can contribute to greater well-being (Shapiro et al., 2006). Moreover, mindfulness involves being nonjudgmental and accepting of feelings and thoughts, which may enhance one’s level of affect tolerance because distress would be experienced as less unpleasant and

threatening (Bishop et al., 2004). While mindfulness enables one to simply observe and witness present moment experiences without deriving meaning from them, mindfulness should not be regarded as antithetical to evaluation. Instead, mindfulness allows one to closely attend to feelings and thoughts while being aware of what is happening (Good et al., 2016). This enables individuals to see things with greater clarity and objectivity that allows acting mindfully and not automatically.

Mindfulness and Inauthenticity

Employees may face challenging work demands in their jobs and those can have a negative impact on mental health. One such work demand is that employees may have to be inauthentic at work. This section will elaborate on authenticity, why employees may feel and behave inauthentically at work and how mindfulness could play a role buffering the negative impact of inauthenticity on mental health.

Authenticity is a concept that has been widely discussed throughout history and has its roots in philosophical ideas attempting to gain an understanding of who one really is and how to lead a good life, involving the acquisition of self-understanding, showing behaviour that derives from self-knowledge and freely choosing to act in line with one's own values (Kernis & Goldman, 2006). Psychological perspectives rooted in Self-determination Theory (SDT) emphasise autonomy as a defining characteristic of authenticity: that it involves to volitionally and genuinely act in congruence with one's values and interests (Ryan & Ryan, 2019).

Several psychological self-report measures of authenticity exist that originate from different theories, but show conceptual overlap. Kernis and Goldman (2006) for example conceptualise authenticity through the lens of SDT, defining authenticity as a combination of factors including awareness of the self, unbiased processing with respect to self-relevant information, behaviour that is in congruence with one's values and beliefs, and relational orientation, that means being open and truthful with respect to

oneself in relationships. Wood et al. (2008) in contrast adopt a person-centred approach, defining authenticity through authentic living and inauthenticity through self-alienation and accepting external influence.

Both conceptualisations of authenticity show overlap with respect to two components that seem to be core to authenticity: a component involving self-awareness and a component concerned with self-expression (Knoll et al., 2015). Authentic self-awareness entails knowledge of the self as whole while being consistently committed to further exploring what constitutes the self. Authentic self-expression on the other hand involves the presentation of one's identity through behaviour, decisions and physical appearance (Knoll et al., 2015).

While the self-report measures by Wood et al. (2008) and Kernis and Goldman (2006) are widely used measures, they do not seem to be ideal for organisational research purposes. Only two out of three subscales of Wood et al.'s (2008) measure show relationships with organisational outcomes and the self-alienation scale exhibits skewed distributions in non-clinical samples (van den Bosch & Taris, 2014). Kernis and Goldman's (2006) measure contains 45 items across four subscales and seems to be too long for organisational studies with additional poor internal consistency for one subscale (Knoll et al., 2015). For this reason, Knoll et al. (2015) developed an integrated authenticity measure using eight items based on the existing authenticity measures by creating a self-awareness and self-expression scale representing together the overarching authenticity construct. This measure of authenticity was found to relate to antecedents of positive organisational behaviour and can therefore be used to assess authenticity at work. This definition of authenticity, involving self-awareness and self-expression, will therefore be used throughout this thesis.

It is well-established that feeling authentic is good for our well-being (Sutton, 2020) and it is also associated with positive work attitudes and behaviours (Song et al.,

2020). While research indicates that employees benefit from being authentic, they do not always feel that their organisational environment or their jobs allow them to be authentic (Smith & Geddes, 2018, Sutton, 2018). Employees may behave inauthentically at work for many reasons, for instance to avoid conflict or because they feel their role requires it. Being authentic may therefore be a challenge for many employees and is not always possible. Unfortunately, this inauthenticity at work can have detrimental effects on mental health, indicating links to a depressive mood (Erickson & Wharton, 1997). It is argued that negative psychological outcomes due to inauthenticity arise because individuals do not feel that they are liked for their true self and because forcing unnatural behaviour is exhausting (Leary, 2003).

Considering the various reasons why inauthenticity at work may occur, and its negative impact on mental health, it is necessary to examine which factors could help to buffer the negative relationship between inauthenticity on mental health and mindfulness could be one of those factors. Research shows that there is a positive link between authenticity and mindfulness, and that both are associated with higher levels of well-being (Allan et al., 2015). Considering that mindfulness is defined as an accepting and nonjudgmental stance regarding present moment experiences (Kabat-Zinn, 2003), it is plausible that mindfulness may alleviate levels of depression while experiencing feelings of inauthenticity. Highly mindful employees may be able to recognise and acknowledge their inauthentic behaviour, but are accepting and nonjudgmental of it, weakening the negative psychological impact of inauthenticity.

Authenticity seems to be an important contributor to well-being. However, organisational environments may create feelings of inauthenticity, which could have a negative mental health effect. This thesis aims to investigate whether mindfulness could play a buffering role in this relationship, addressing the following Research Question:

1a) Does mindfulness help employees to deal with specific challenges at work?
Specifically, can mindfulness buffer the negative effect of inauthenticity on depression?

Mindfulness and Readiness for Change

This section will discuss another workplace demand employees face: organisational change. Change is a common challenge in organisations today and employees may struggle to deal with it. This section will explore whether mindfulness could contribute to positive outcomes in times of change, such as higher readiness for change.

A major stressor that challenged many people over the past year is the COVID-19 pandemic. Social and organisational constraints associated with the pandemic put a lot of pressure on organisations and their employees in particular. Home office work, social distancing requirements and strict hygiene rules required quick adaption to changes in jobs for many of us (Semple & Cherrie, 2020). Successful organisational change is known to be a challenge for organisations and their employees (Burnes, 2011) and employees' readiness for change is an important prerequisite for successful change (Oreg et al., 2011).

Employee readiness for change is a construct that includes an affective, cognitive and behavioural component concerning change (Armenakis et al., 1993; Armenakis et al., 2007; Bouckennooghe et al., 2009). The affective component reflects how an employee feels about the anticipated change, whereas the cognitive component indicates the employee's beliefs regarding the usefulness or necessity of the change. The behavioural component of readiness for change encompasses the employee's intentions to support and commit to the change (Bouckennooghe et al., 2009). Readiness for change has been shown to be positively associated with organisational performance (Imam et al., 2013) and negatively associated with turnover (Chênevert et al., 2019),

which in turn may work in favour of change implementation.

Since employee readiness for change is important for successful organisational change, it is essential to identify what factors enhance change readiness. An important requirement for the development of change readiness is the creation of the attitude that change is needed as well as ensuring that employees have the efficacy to implement change (Armenakis et al., 1993). The employees' ability to see the discrepancy between the current state and the desired state as well as the appropriateness of change are therefore important factors associated with change readiness (Rafferty & Minbashian, 2019). Moreover, trust in management, supervisor support, clear communication regarding the change, as well as the perceived impact of change help to create a climate that promotes readiness for change (Rafferty & Minbashian, 2019; Vakola, 2014).

While these factors are centred around managerial actions and the organisational context, there are also psychological capacities that are linked to higher levels of change readiness. These include self-efficacy and positive core self-evaluations (Cunningham et al., 2002; Vakola, 2014), optimism, hope, and resilience (Kirrane et al., 2016).

Employees who possess high levels of these psychological capacities feel more confident to be able to implement change at work and do find ways of attaining a goal even when processes are not running smoothly. This in turn makes them more likely to show change readiness and pursue its benefits.

There are many reasons why mindfulness may also be a beneficial capacity with respect to change readiness. For example, in order to be able to adjust thinking and behaviour at work to align with the anticipated change, one has to be able to detect patterns in one's own thought and behaviour patterns that may interfere with the accomplishment of goals. Mindful employees are more likely to recognise counterproductive or pessimistic thoughts and behaviour and can alter them (Avey et al., 2008), which may help organisational change. In addition to that, employees who

experience negative emotions because of change may be able to better deal with those through mindfulness. Rather than reacting impulsively, they may be able to take a step back and react in a manner that is more appropriate in a given context (Shapiro et al., 2006). This means that mindful employees might show change readiness despite of negative emotions and even if they are not fully convinced of the benefits of the change. They may be able to see the issue from multiple perspectives, and also consider the evaluation of alternatives and the consequences of not committing to change (Gärtner, 2013).

Mindfulness may also work in favour of change readiness because mindful employees are less likely to act as a result of automaticity (Gärtner, 2013; Shapiro et al., 2006), which may help to adjust to new tasks and processes as work. For example, most employed individuals will find that they have to change the way they work and cannot stick to old habits and patterns, especially in times of COVID-19. A higher level of mindfulness may help to change old work patterns that are not appropriate anymore. With respect to COVID-19, it is likely that many employees do not like the changes they experience in their jobs, however, more mindful individuals might be able to let go of negative emotions and see the necessity of those changes or the potential negative consequences of not adhering to changed work procedures. This reasoning implies that not all organisational change is good per se, however, mindfulness may enable employees to have a more nuanced view and see changes and their necessity relative to alternatives instead of opposing the change right away (Gärtner, 2013).

Research with respect to the benefits of mindfulness to enhance employee readiness for change is scarce. Investigating the role of mindfulness during organisational change is needed though, because it is an inherent psychological capacity that could help organisations and employees to better deal with changes in the workplace. Especially with respect to fast-paced changes happening due to COVID-19,

it is important to research whether mindful employees may have an advantage when facing change at work. This thesis will address the following Research Question:

1b) Does mindfulness help employees to deal with specific challenges at work?

Specifically, can mindfulness enhance readiness for change in the workplace?

Mindfulness, Well-being and Attentional Performance

This section will discuss mind wandering and associated attentional performance issues in a demanding work environment. Enhancing levels of mindfulness could target mind wandering and poor attentional performance, which will be the primary focus of this section.

A high level of attention and the ability to execute tasks with a high degree of accuracy is essential in many jobs. Mind wandering, characterised as off-task stimulus-independent thinking while conducting a task, could compromise job performance (Stawarczyk et al., 2012). These lapses where attention is not on the task at hand could have disastrous effects in jobs where it is necessary to perform with a high degree of accuracy or where situational circumstances can change quickly and require immediate behaviour adjustment, such as in aviation (Jones & Endsley, 1996), health care (Fore & Sculli, 2013), or the military (Jha et al., 2015).

While sustained attention to a task is important, mind wandering is very common. Real-time experience sampling with more than 2000 participants indicated that mind wandering was reported in almost 47% of cases and in at least 30% mind wandering occurs during every recorded activity (Killingsworth & Gilbert, 2010). Furthermore, mind wandering is more likely when experiencing stress (Crosswell et al., 2020), which is particularly concerning when considering that jobs which require a high level of attention are likely to be demanding and stressful, such as nursing or military services. For example, high-demand military training prior to deployment was found to

impair cognitive performance of soldiers over time (Jha et al., 2015). Considering the relationship between stress and mind wandering, as well as the potential negative consequence on tasks that require undivided attention, it is necessary to examine ways of maintaining cognitive performance in demanding work settings.

Research suggests that mindfulness exhibits a negative correlation with both self-reported as well as indirect measures of mind wandering and that mindfulness practice can reduce indicators of mind wandering during a sustained attention to response task (SART), which is an objective measure of attentional lapses by requiring correct behavioural reactions to presented stimuli (Mrazek et al., 2012). An experimental study with military cohorts that were undergoing demanding pre-deployment training found that an MBI can protect against cognitive performance degeneration measured through performance on the SART compared to control groups who received no training or a didactic mindfulness training (Jha et al., 2015). These findings show that mindfulness training may provide protection from the negative effects of stressful work conditions on cognitive performance. Furthermore, it was found that a 4-week MBI in elite military cohorts can improve performance on the SART compared to a 2-week MBI group and a control group (Zanesco et al., 2019).

Research has predominantly analysed the cognitive performance effects of MBIs in already highly skilled groups of professionals, such as elite military cohorts (Jha et al., 2015; Zanesco et al., 2019). But starting a new job or getting used to work life can also be highly stressful, and MBIs show beneficial mental health effects for student nurses (Linden et al., 2001) or new army recruits (Guo et al., 2019). Jha et al. (2007) found positive effects of an 8-week MBI on attention-related behavioural responses in medical and nursing students but did not assess whether those effects could be sustained over a longer period of time after completion of the intervention. Gaining knowledge regarding the effectiveness of mindfulness in preventing cognitive performance decline

or even enhancing cognitive performance during training programmes, and whether those effects are long-lasting, is important to ensure continued success in the new profession.

Mind wandering and attentional lapses are not rare, especially when being exposed to stressful situations. Mindfulness interventions can enhance well-being and protect from deteriorating cognitive performance and even enhance it in experienced professionals. This thesis aims to investigate whether this is also true for individuals who are still in training, addressing the following Research Question:

2a) How can we effectively enhance mindfulness and associated performance and mental health outcomes? Specifically, can a low-dose MBI maintain and enhance attentional performance and well-being?

Mindfulness-based Interventions

Considering the promising mental health effects of mindfulness, it is worth discussing how this capacity can be enhanced. Many MBIs conducted in organisations today are based on the principles of mindfulness-based stress reduction (MBSR) developed by Kabat-Zinn (1982) for patients suffering from chronic pain (Jamieson & Tuckey, 2017). The primary focus of this section will be to discuss the application of MBIs in organisational contexts.

MBSR teaches mindfulness practices such as body scans and breathing techniques and also incorporates yoga practice. Participants are instructed to focus on present moment experiences and observe emotions as they arise. Participants are further encouraged to try to distinguish between the felt emotion and any thoughts or interpretations of it. Rather than getting involved in thoughts or judgements regarding emotions, participants are instructed to observe and not judge them as either good or

bad (Kabat-Zinn, 1982). Kabat-Zinn showed in multiple studies with clinical samples that MBSR has a positive effect on various health conditions, such as better coping with pain (Kabat-Zinn, 1982), clearing up of inflammatory skin conditions (Kabat-Zinn et al., 1998) and enhancement of the immune system (Davidson et al., 2003).

Considering the positive impact of mindfulness in clinical settings, interest grew in the benefits of mindfulness practice in organisations. A meta-analysis of mindfulness workplace interventions investigating 56 randomised controlled trials showed that such interventions achieve improvements in mindfulness, stress, well-being, work outcomes and resilience. More specifically, medium-sized effects of workplace MBIs were found for well-being, life satisfaction, compassion, perceived stress, subsyndromal symptoms and work engagement (Vonderlin et al., 2020).

While many MBIs are similar in content teaching body scans, breathing techniques and implementing yoga elements, there is a lot of variation regarding the intervention length (Carmody & Baer, 2009; Vonderlin et al., 2020). Traditional MBI protocols based on MBSR are rather time-consuming with 2.5 hours of weekly contact session training and 45 minutes of daily home practice over a period of eight weeks with one full-day practice retreat (Jamieson & Tuckey, 2017), which may be a barrier to adoption for many individuals and organisations. Non-clinical participants of MBIs that use these long protocols might not show the required compliance and even withdraw, which could contribute to a decrease in effectiveness of such MBIs (Demarzo et al., 2017).

It is important that participants adhere to practice protocols, however, this time commitment has to align with busy work schedules. For this reason, researchers started to investigate the effectiveness of significantly shorter protocols, also referred to as ‘low-dose’ interventions. Those low-dose interventions typically reduce the number of weeks with contact sessions and/or the hours of meditation practice (Carmody & Baer,

2009; Virgili, 2015). Low-dose MBIs with reduced contact hours or length may make it easier for individuals from the general population to participate, however, it is discussed if abbreviated MBIs result in poorer intervention outcomes (Carmody & Baer, 2009).

Carmody and Baer (2009) concluded in a review that there was no relationship between intervention length and effects on measures of distress, indicating that shorter interventions are not inferior to standard protocols. Demarzo et al. (2017) also found similar effects between a standard length MBI and an abbreviated four-week long MBI compared to a control group with respect to mindfulness, positive affect and anxiety levels post-intervention and at a six-month follow-up. Moreover, a meta-analysis that looked at the effects of standard length and abbreviated MBIs concluded that low-dose MBIs adapted for workplace settings are equal in efficacy compared to standard length MBIs designed for clinical populations (Virgili, 2015).

Even though evidence shows that low-dose MBIs could generally work as well as standard length MBIs, not all low-dose MBIs show the anticipated effects (Chin et al., 2019; Howells et al., 2016). For example, Chin et al. (2019) found that a high-dose MBI led to decreases in employee stress and provided protection against decreases in positive affect and increases in negative affect at work, whereas a low-dose MBI did not produce these effects. Moreover, Howells et al. (2016) only found positive effects of a low-dose MBI with respect to positive affect and depression, but did not see an impact on life satisfaction, negative affect, and flourishing. These findings conflict with previous studies that did not find dose-related effects (Carmody & Baer, 2009; Demarzo et al., 2017; Virgili, 2015).

One possible explanation for these contradictory findings is that Howells et al.'s (2016) and Chin et al.'s (2019) studies used low-dose MBIs that were possibly too short, namely a 10-minute guided meditation exercise for 10 days (Howells et al., 2016) and a 4-hour single day mindfulness training (Chin et al., 2019). The shortest

intervention in Carmody and Baer's (2009) review in contrast had four 1.5-hour mindfulness training sessions and a full-day session. Virgili's (2015) meta-analysis analysed low-dose and standard length MBIs and found that effects are not influenced by intervention type or in-class hours, however, practice hour comparisons were made with interventions containing less than 20 vs. more than 21 hours, which is still a relatively high number of hours that were being contrasted. Demarzo et al.'s (2017) study found similar effects between a 4-week and an 8-week MBI with weekly 2-hour sessions, but it shows that the low-dose MBI still had more practice hours than Howells et al.'s (2016) and Chin et al.'s (2019) studies. These findings raise the question of what a 'minimum effective dose' might be, but also whether other, so far neglected factors, such as participant characteristics may determine whether low-dose MBIs show positive effects or not. Hyland et al. (2015) suggested more closely investigating who benefits from MBIs in organisational contexts.

Previous research with students has shown that individuals with higher pre-treatment levels of mindfulness show larger improvements in mindfulness, well-being, and distress after a standard length MBI (Shapiro et al., 2011). Shapiro et al. (2011) assume that more mindful participants might have found it easier to engage with the intervention content. It is therefore plausible that individual differences in psychological variables prior to an MBI may have an impact on its effectiveness. Research should therefore address this issue in order to analyse for whom a low-dose MBI is most beneficial.

Low-dose MBIs show promising effects for populations who could find it difficult to implement time-consuming protocols. However, they may work better for some individuals than for others, and it is necessary to investigate this to make sure that participants of MBIs benefit from it. Examining individual characteristics that influence

the effectiveness of MBIs is therefore an important area of research. This thesis aims to address the following Research Question:

2b) How can we effectively enhance mindfulness and associated performance and mental health outcomes? Specifically, under what conditions is a low-dose MBI effective in alleviating distress?

Mindfulness Facets

The practice of mindfulness through MBIs aims at developing different mindfulness capacities. This involves the ability to observe and describe internal experiences, to act with awareness, as well as being nonjudgmental with respect to arising feelings and thoughts. These capacities are targeted in mindfulness interventions by practicing mindfulness. From a psychometric point of view, mindfulness is also considered a multi-faceted construct, often measured with the Five Facet Mindfulness Questionnaire (Baer et al., 2006). The measurement of mindfulness through different facets reflecting different capacities will allow practitioners to identify strengths and weaknesses regarding the use of mindfulness capacities in their clients (Baer et al., 2004).

Moreover, previous research found that different mindfulness facets correlate differently with measures of well-being and distress (Bergin & Pakenham, 2016; Cash & Whittingham, 2010; Medvedev et al., 2018). While the facets of Acting with awareness, Nonjudging and Nonreacting (Bergin & Pakenham, 2016; Cash & Whittingham, 2010; Medvedev et al., 2018) were more often associated with lower distress, the facets Nonjudging and Describing were more often related to measures of well-being (Bergin & Pakenham, 2016; Bowlin & Baer, 2012). An overview of these studies can be found in Table 1. Table 1 contains studies that investigated the relationship of mindfulness facets with mental health. Mental health is researched through the examination of aspects of well-being and distress. Distress is understood as

consisting of stress, anxiety and depression (Lovibond & Lovibond, 1995). Wellbeing is assessed and examined as hedonic (affective) and/or eudaimonic (motivational) well-being (Tennant et al., 2007).

Differentiating the contribution of mindfulness facets to mental health outcomes and identifying their relative importance may therefore help to design interventions more effectively, targeting the needs of participants. This means for instance that individuals who do not experience clinical symptoms of distress, but want to focus on further enhancing their well-being, could focus on being more nonjudgmental regarding their feelings and thoughts. A major weakness of the studies presented in Table 1 is that many of them did not assess well-being and distress simultaneously, which does not allow a valid differentiation between beneficial functions of mindfulness facets.

In addition to that, statistical approaches did not allow the ranking of facets according to their relative importance. Knowledge regarding different functions of mindfulness capacities may possibly allow future tailoring of MBIs according to the needs of individuals. Investigating the importance of the various mindfulness facets with respect to different health outcomes is therefore subject of investigation in this thesis. This thesis will address the following Research Question:

2c) How can we effectively enhance mindfulness and associated performance and mental health outcomes? Specifically, do the mindfulness facets contribute differently to well-being and psychological distress?

Table 1

Summary of articles that investigated the relationship of the FFMQ's facets with measures of well-being and distress. Articles are listed in chronological order.

Study	Sample	Predictors	Outcomes	Method	Results	Limitations
Cash & Whittingham, 2010	Student and non-student sample (n=106)	Age, occupation, education, FFMQ	DASS, PWI	Hierarchical multiple regression	After controlling for age, occupation, and education, Nonjudging inversely predicts depression ($\beta=-.31$, $p<.05$), anxiety ($\beta=-.36$, $p<.01$) and stress ($\beta=-.33$, $p<.01$) Acting with awareness inversely predicts depression ($\beta=-.36$, $p<.01$)	Small sample Facets sharing common variance were entered together in one regression step: difficult to determine the most relevant predictors
Bowlin & Baer, 2012	UG and Honours students (n=280)	GPA, ACT, SCS, FFMQ	PWB, DASS	Hierarchical multiple regression	After controlling for GPA, ACT and SCS, all FFQ facets were entered simultaneously. Describing and Nonjudging were significant predictors of well-being; all facets except Describing were significant predictors of distress	Student sample Facets sharing common variance were entered together in one regression step: difficult to determine the most relevant predictors
Slonim et al., 2015	UG students (n=207)	FFMQ	DASS	Canonical correlations	Low levels of depression are associated with higher levels of Nonjudging ($r=-.87$; $b=-.56$), Nonreacting ($r=-.67$; $b=-.45$); Acting with awareness ($r=-.60$; $b=-.13$) and Describing ($r=-.39$; $b=-.21$)	Sample only consists of students No measures of well-being, limiting comparison with distress
Soysa & Wilcomb, 2015	UG students (n=204)	Gender, SES, SCS-SF, FFMQ	DASS, WEMWBS	Hierarchical multiple regression	After controlling for gender, self-efficacy, and self-compassion, Describing predicts well-being ($\beta=.26$, $p<.001$) and inversely predicts depression ($\beta=-.19$, $p<.01$) After controlling for gender, self-efficacy, and self-compassion, Nonjudging predicts well-being ($\beta=.17$, $p<.01$) and inversely predicts depression ($\beta=-.18$, $p<.01$), anxiety ($\beta=-.31$, $p<.001$) and stress ($\beta=-.28$, $p<.001$)	Sample only consists of students Facets sharing common variance were entered together in one regression step: difficult to determine the most relevant predictors

Study	Sample	Predictors	Outcomes	Method	Results	Limitations
Bergin & Pakenham, 2016	UG students (n=481)	FFMQ, LSPSS	DASS, SWLS, PWB	Hierarchical multiple regression	After controlling for gender, self-efficacy, and self-compassion, Acting with awareness inversely predicts depression ($\beta = -.15$, $p < .05$) and stress ($\beta = -.23$, $p < .001$);	Sample only consists of students Facets sharing common variance were entered together in one regression step: difficult to determine the most relevant predictors
					After controlling for gender, self-efficacy, and self-compassion, Nonreacting inversely predicts anxiety ($\beta = -.15$, $p < .05$) and stress ($\beta = -.11$, $p < .05$)	
					After controlling for age, gender, and stress Observing predicts anxiety ($\beta = .11$, $p < .01$), life satisfaction ($\beta = .14$, $p < .001$), personal growth ($\beta = .14$, $p < .001$), positive relationships ($\beta = .12$, $p < .01$) and self-acceptance ($\beta = .09$, $p < .05$)	
					After controlling for age, gender, and stress Describing inversely predicts depression ($\beta = -.11$, $p < .01$) and anxiety ($\beta = -.10$, $p < .05$) and predicts life satisfaction ($\beta = .20$, $p < .001$), autonomy ($\beta = .38$, $p < .001$), environmental mastery ($\beta = .14$, $p < .001$), personal growth ($\beta = .29$, $p < .001$), positive relationships ($\beta = .27$, $p < .001$), purpose in life ($\beta = .22$, $p < .001$) and self-acceptance ($\beta = .21$, $p < .001$)	
					After controlling for age, gender, and stress, Acting with awareness inversely predicts depression ($\beta = -.25$, $p < .001$) and anxiety ($\beta = -.15$, $p < .001$) and predicts life satisfaction ($\beta = .10$, $p < .05$), environmental mastery ($\beta = .31$, $p < .001$), positive relationships ($\beta = .18$, $p < .001$) and purpose in life ($\beta = .29$, $p < .001$)	
					After controlling for age, gender, and stress, Nonjudging inversely predicts depression ($\beta = -.27$, $p < .001$) and anxiety ($\beta = -.21$, $p < .001$) and predicts life satisfaction ($\beta = .24$, $p < .001$), environmental mastery ($\beta = .17$, $p < .001$), personal growth ($\beta = .12$, $p < .05$), positive relationships ($\beta = .13$, $p < .01$), and self-acceptance ($\beta = .29$, $p < .001$)	

Study	Sample	Predictors	Outcomes	Method	Results	Limitations
					After controlling for age, gender, and stress, Nonreacting inversely predicts depression ($\beta=-.09$, $p<.05$) and predicts autonomy ($\beta=.10$, $p<.05$), environmental mastery ($\beta=.09$, $p<.05$), and self-acceptance ($\beta=.14$, $p<.001$)	
Short et al., 2016	UG students (n=77)	FFMQ, DKEFS	PANAS, DASS, BRIEF, SCMS	Partial correlation analysis	<p>Nonjudging negatively correlated with executive dysfunction ($pr=-.29$, $p < .01$), behavioral regulation ($pr=-.39$, $p < .01$), negative affect($pr=-.47$, $p<.01$), depression ($pr=-.47$, $p < .01$) , anxiety($pr=-.37$, $p<.01$), and stress ($pr=-.43$, $p<.01$)</p> <p>Nonreacting negatively correlated with behavioral regulation ($pr=-.24$, $p<.05$)</p> <p>Describing positively correlated with total self-regulation ($pr=.37$, $p<.01$) , self-monitoring ($pr=.24$, $p<.05$) , and self-evaluation ($pr=.46$, $p<.01$) and negatively correlated with depression ($pr=-.22$, $p<.05$) and anxiety ($p =-.22$, $p<.05$)</p> <p>Acting with awareness correlated with executive dysfunction ($pr=-.45$, $p<.01$), self-regulation ($pr=.30$, $p<.01$), self-monitoring ($pr=.27$, $p<.05$), self-evaluation ($pr=.34$, $p<.01$), positive affect ($pr=.31$, $p<.01$), depression ($pr=-.32$, $p<.01$), anxiety ($pr=-.31$, $p<.01$), and stress ($pr=-.37$, $p<.01$)</p>	Small sample and student sample only
Hawley et al., 2017	Psychiatric patients (n=445)	FFMQ, PDSS-SR T1, PSWQ T1, YBOCS-SR T1	PDSS-SR T2, PSWQ T2, YBOCS-SR T2	Hierarchical multiple regression	<p>Acting with awareness pre-CBT treatment predicts fewer panic disorder symptoms ($\beta=-.49$, $p<.001$) and alleviates the severity of worrying ($\beta=-.38$, $p=.01$) post-CBT treatment.</p> <p>Nonreacting pre-CBT treatment predicts symptom alleviation of obsessive-compulsive disorders ($\beta=-.48$, $p<.001$) post-CBT treatment</p>	Clinical sample: findings not applicable for the general population Facets sharing common variance were entered together in one regression step: difficult to determine the most relevant predictors

Study	Sample	Predictors	Outcomes	Method	Results	Limitations
Medvedev et al., 2018	General population (n=200) UG students (n=200)	Gender, age, meditation practice, FFMQ	DASS	Stepwise multiple regression	<p>Nonjudging inversely predicts distress ($\beta=-.41$, $p<.001$), ($\beta=-.40$, $p<.001$), depression ($\beta=-.42$, $p<.001$); ($\beta=-.32$, $p<.001$), anxiety ($\beta=-.36$, $p<.001$); ($\beta=-.46$, $p<.001$) and stress ($\beta=-.42$, $p<.001$); ($\beta=-.38$, $p<.001$) in a student sample and a sample from the general population</p> <p>Nonreacting inversely predicts distress ($\beta=-.19$, $p<.01$); ($\beta=-.18$, $p<.05$), depression ($\beta=-.21$, $p<.01$); ($\beta=-.18$, $p<.01$), and stress ($\beta=-.28$, $p<.001$); ($\beta=-.21$, $p<.01$) in a student sample and a sample from the general population</p> <p>Acting with awareness inversely predicts distress ($\beta=-.17$, $p=.01$), anxiety ($\beta=-.28$, $p<.01$), and stress ($\beta=-.21$, $p<.01$) in a student sample</p>	Does not include measures of well-being, limiting comparison with distress

Note: UG=Undergraduate Students; FFMQ=Five Facet Mindfulness Questionnaire; DASS=Depression, Anxiety and Stress Scales-21; PWI=Personal Well-Being Index; GPA=Grade Point Average; ACT= American College Testing; SCS= Self-Control Scale; SES= Self-Efficacy Scale; SCS-SF=Self-Compassion Scale-Short Form; WEMWMB=Warwick Edinburgh Mental Well-Being Scale; LSPSS=Law Student Perceived Stress Scale; SWLS=Satisfaction with Life Scale; PWB=Scales of Psychological Well-Being; DKEFS= Delis–Kaplan Executive Function System; PANAS=Positive Affect and Negative Affect Schedule; BIEF= Behavior Rating Inventory of Executive Function—Adult; SCMS= Self-Control Self-Management Scale; PDSS-R= Panic Disorder Severity Scale-Self Report; PSWQ= Penn State Worry Questionnaire; YBOCS-SR= Yale-Brown Obsessive-Compulsive Scale – Self Report

Research Aims

Having outlined the current challenges for employees and organisations, this thesis aims at investigating the effectiveness of mindfulness as a useful capacity that could help employees deal with the challenges they face at work, such as feelings of inauthenticity, organisational change or impaired cognitive performance. Moreover, given the attractiveness of low-dose MBIs but inconsistent findings regarding their effectiveness, identification of factors that determine their success is needed. These MBIs help participants develop various mindfulness capacities and it will be beneficial to identify the relative importance of those capacities to mental health outcomes, such as well-being and distress. In summary, this research focuses on two main questions:

1) Does mindfulness help employees to deal with specific challenges at work?

Specifically,

- a) Can mindfulness buffer the negative effect of inauthenticity on depression?
- b) Can mindfulness enhance readiness for change in the workplace?

If so, and given the extensive body of research demonstrating the positive associations of mindfulness,

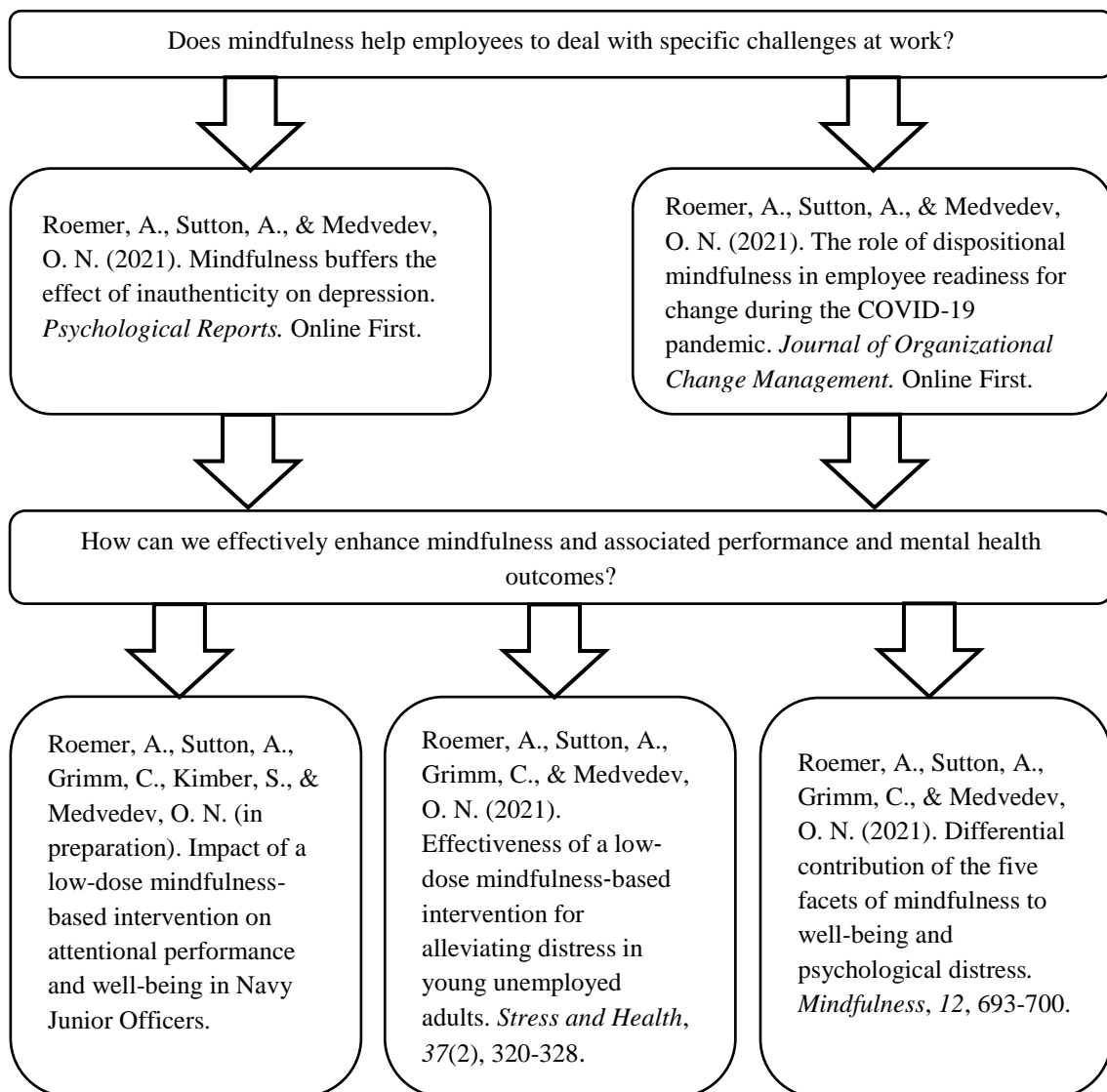
2) How can we effectively enhance mindfulness and associated performance and mental health outcomes? Specifically,

- a) Can a low-dose MBI maintain and enhance attentional performance and well-being?
- b) Under what conditions is a low-dose MBI effective in alleviating distress?
- c) Do the mindfulness facets contribute differently to well-being and psychological distress?

Figure 1 illustrates how these Research Questions are addressed in the studies in this thesis. In the conclusion, this thesis will provide recommendations to organisations and mindfulness practitioners regarding the use mindfulness in challenging work environments as well as recommendations for effective mindfulness development.

Figure 1

Diagram of studies conducted to address research questions of the thesis



Study One (Mindfulness buffers the effect of inauthenticity on depression) investigated whether mindfulness can reduce the impact of inauthenticity on levels of depression. It served the purpose to understand whether mindfulness can protect individuals from the detrimental effects of inauthenticity on mental health. Mindfulness could therefore be used to help individuals to deal with the possible negative impact that results from feelings of inauthenticity.

Study Two (The role of dispositional mindfulness in employee readiness for change during the COVID-19 pandemic) served the purpose to investigate whether mindfulness helps employees to deal with changes in the workplace. This study was conducted during the COVID-19 pandemic when many people faced changes in their jobs. The main goal was to understand whether more mindful employees would show a higher readiness for organisational change. Knowledge regarding the role of mindfulness in organisational change settings might help organisations to better prepare their employees to deal with change.

Study Three (Impact of a low-dose mindfulness intervention on sustained attention and well-being in new Navy Junior Officers) investigated whether a low-dose MBI was effective in maintaining and improving cognitive performance and well-being in a sample of Navy cadets in training. It served the purpose to understand whether mindfulness training can reduce mind wandering, increase accuracy on a sustained attention to response task and positively impact well-being levels. If mindfulness can help to reduce attentional lapses and improve well-being, performance can be enhanced in professions that rely on employees who have to accurately and quickly execute tasks in their jobs.

Study Four (Effectiveness of a low-dose mindfulness-based intervention for alleviating distress in young unemployed adults) investigated whether a low-dose MBI was effective in reducing distress levels in unemployed individuals while controlling for

psychological variables at baseline. This served the purpose to find out for whom such abbreviated interventions are most effective. Knowledge regarding individual factors that influence the intervention outcome will help to assign participants to the right intervention format for them.

Study Five (Differential contribution of the five facets of mindfulness to well-being and psychological distress) was to analyse whether different facets of mindfulness related differently to well-being and distress. This served the purpose to deconstruct the mechanism of mindfulness impacting both positive and negative mental health outcomes. Knowledge regarding this mechanism may help to further refine and tailor MBIs.

Chapter Two

Mindfulness and Inauthenticity

Paper title and publication status:

Roemer, A., Sutton, A., & Medvedev, O. N. (2021). Mindfulness buffers the effect of inauthenticity on depression. *Psychological Reports*. Online First.

<https://doi.org/10.1177/00332941211012941> [Impact factor: 1.53]

Publisher: SAGE Publishing

Abstract

Objectives: Pressures in daily life limit one's ability to be authentic and research shows that inauthenticity can be detrimental to mental health. Mindfulness is known to have a protective effect on mental health through an accepting and nonjudgmental stance. This study aimed to establish whether mindfulness buffers the relationship between inauthenticity and depression.

Method: A cross-sectional sample of employed individuals in New Zealand ($n=301$) completed an online survey assessing their levels of authenticity, mindfulness, and depression.

Results: Findings indicate that authenticity and mindfulness together explain 29% of variance in depression. In addition, mindfulness can buffer the negative impact of low authenticity on depression.

Conclusion: Inauthenticity is related to higher levels of depression, but mindfulness is able to buffer this impact. These findings imply that engaging in mindfulness practice may be beneficial for mental health when individuals experience reduced authenticity.

Key words: Authenticity, mindfulness, depression, mental health, protective factors

Introduction

Being true to ourselves, being authentic, plays a key role in living a fulfilling life.

Authenticity has its roots in philosophical ideas that aimed at understanding the true self and relevant psychological and behavioural processes that individuals use to explore, enhance and sustain such understanding (Kernis & Goldman, 2006).

Authenticity also increasingly attracted the interest of scholars in psychology who developed measures to assess the construct and its potential outcomes. Even though these measures are derived from different theories, they show significant conceptual overlap. For example, Kernis and Goldman (2006) borrow from Self-determination Theory (SDT) and humanistic perspectives, conceptualising authenticity through awareness of the self, processing of self-relevant information without bias, exhibiting behaviour that is in congruence with one's values and beliefs, and relational orientation. Wood et al. (2008) on the other hand conceptualise authenticity through a person-centred perspective, involving self-alienation, authentic living, and accepting external influence. Both conceptualisations of authenticity have in common that they include a self-awareness and a self-expression component that seem to be essential to the construct of authenticity (Knoll et al., 2015). While authentic self-awareness refers to knowledge of the self and the continuous exploration of what constitutes the self, self-expression includes the representation of the self through one's decisions, behaviour and physical appearance (Knoll et al., 2015).

It is well established that being authentic is good for our well-being (Sutton, 2020) and that inauthenticity has negative effects on mental health. For example, recent literature suggests that being inauthentic is positively related to distress (Boyratz et al., 2014; Grijak, 2017) and that higher levels of self-alienation are positively associated with depression (Turner et al., 2020). However, there are many pressures that limit our ability to be authentic, such as the expectation to act professionally or avoid conflict in

workplace settings (Sutton, 2018). Considering it is not always possible or may not even be appropriate to be authentic, it is crucial to identify a mechanism that may be able to buffer the negative impact of inauthenticity on mental health.

Mindfulness could provide this buffering mechanism. Mindfulness is an inherent human capacity that is defined as enhanced awareness and attention to the present moment while being nonjudgmental and accepting of experiences (Kabat-Zinn, 2003). Mindfulness enables one to be more objective about both internal and external experiences and interrupts habits that are maladaptive or a result of automaticity, leading to better mental health outcomes (Shapiro et al., 2006). One of the most comprehensive measures of mindfulness that was constructed by factor-analysing several commonly used measures is the Five Facets Mindfulness Questionnaire (FFMQ) that consists of the facets Observing, Describing, Nonjudging, Nonreacting, and Acting with awareness (Baer et al., 2006). Baer et al. (2008) found that all FFMQ facets except acting with awareness are associated with meditation experience. However, there are also discussions in the literature that non-meditators may actually score higher on self-report measures (Grossman, 2019) due to the Dunning-Kruger effect, which states that unskilled people are ignorant to their lack of skills as opposed to experts (Dunning, 2011). Having said that, in a recent study with an appropriate sample size we could not find differences in self-reported mindfulness between meditators and non-meditators (Roemer et al., 2021). For the reasons outlined, the FFMQ can be considered appropriate with non-meditating samples.

On the surface, the Acting with awareness facet of mindfulness seems to have some similarities with the self-awareness dimension of authenticity, but there are differences that need to be elucidated. First of all, Acting with awareness as an aspect of mindfulness refers to attention concerning one's behaviour and perceptions in the present moment (Baer et al., 2008), which explains why mindfulness is associated with

less frequent automaticity and habitual behaviour. Self-awareness as an aspect of authenticity however, rather refers to internal processes of the self, such as having knowledge of one's feelings, values and beliefs (Knoll et al., 2015). These conceptual distinctions are further fostered by a study that reports only a small to moderate correlation between the Acting with awareness facet and authentic self-awareness (Zheng et al., 2020).

Recent research started to investigate the relationship of mindfulness and authenticity, finding that mindfulness and authenticity are positively related to each other and may together contribute to better mental health (Allan et al., 2015; Chen & Murphy, 2019, Zheng et al., 2020). Research also strongly indicates that mindfulness reduces negative affect, anxiety, stress, and depression (Abbasi et al., 2020; Krägeloh et al., 2019; Vorontsova-Wenger et al., 2020). We propose that being mindful, involving a nonjudgmental and accepting stance, could help to reduce the negative effect of inauthenticity on mental health. There are many reasons for a lack of inauthenticity, especially in workplace settings where employees have to meet certain expectations. It is possible that mindfulness enables one to simply acknowledge feelings of inauthenticity without being judgmental and rather accepting of it, which could reduce potential negative effects of inauthenticity on mental health.

Considering that feelings of inauthenticity impair mental health and mindfulness plays a protective role, we propose that mindfulness may be able to buffer the effect of inauthenticity on levels of depression. The aim of this study is to test the hypothesis that mindfulness is a moderator in the relationship between authenticity and depression.

Method

Participants

The sample consisted of 301 employed participants with a mean age of 40.48 ($SD=12.53$) years. One hundred and fifty-two (50.5%) were female and 149 (49.5%) were male. Participants identified themselves as NZ European (68.1%), Asian (13.6%), Māori (7.0%), Pasifika (1.7%), or Other (9.6%).

Procedure

Ethics approval was granted by the authors' institutional ethics committee. The survey was conducted online and distributed through a survey panel. Informed consent was given by participants, data was collected anonymously, and they could withdraw from the survey at any stage prior to final submission. Participants received a small monetary reward for engaging with the survey.

Measures

Mindfulness, authenticity, and depression were assessed using self-report measures, as follows.

Mindfulness. Trait mindfulness assessed with the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006), which consists of 39 items rated on a 5 point-Likert scale (1=never or very rarely true; 5=very often or always true). Items were summed to yield an overall scale score, with a higher score indicating a higher level of mindfulness. The scale was found to be reliable in the present study ($\alpha=.88$).

Authenticity. The Integrated Authenticity Scale (IAS; Knoll et al., 2015) was used to assess authenticity. The scale consists of eight items, which can be rated, on a 7 point-Likert scale (1=does not apply to me at all; 7=applies to me directly). Items were summed to create an overall scale score with higher scores indicating a higher level of authenticity. The IAS was reliable in the present study ($\alpha=.76$).

Depression. The depression subscale of the Depression, Anxiety and Stress Scale (DASS-21; Lovibond & Lovibond, 1995) consists of seven items and can be rated on a scale from 1 (never) to 4 (almost always). Items were summed to yield a scale score with a higher score indicating higher levels of depression. It was found to be very reliable in the present study ($\alpha=.91$).

Data analysis

Data were analysed using IBM SPSS v26. Participants who completed the survey 50% faster than the median completion time were removed to enhance the quality of the dataset (Greszki et al., 2014) resulting in a sample of 256. Skewness and kurtosis for all variables were within the range of -1 and 1, which is considered acceptable (Muthén & Kaplan, 1985).

In order to investigate a moderating effect of mindfulness, a multiple regression analysis was run using the PROCESS macro for SPSS (Hayes, 2017) with authenticity, mindfulness and their interaction term as predictors and depression as an outcome variable.

Results

Correlation analyses (Table 1) show that, as expected, mindfulness and authenticity exhibit a strong, positive relationship ($r=.63, p<.01$). Additionally, depression has a negative relationship with both mindfulness ($r=-.47, p<.01$) and authenticity ($r=-.48, p<.01$).

Table 1

Pearson correlation matrix between the mindfulness total score, the authenticity total score, and the depression total score.

Variable	M	SD	1	2	3
1. Mindfulness	127.58	16.94	(.88)		
2. Authenticity	39.28	7.04	.63**	(.76)	
3. Depression	11.54	4.51	-.47**	-.48**	(.91)

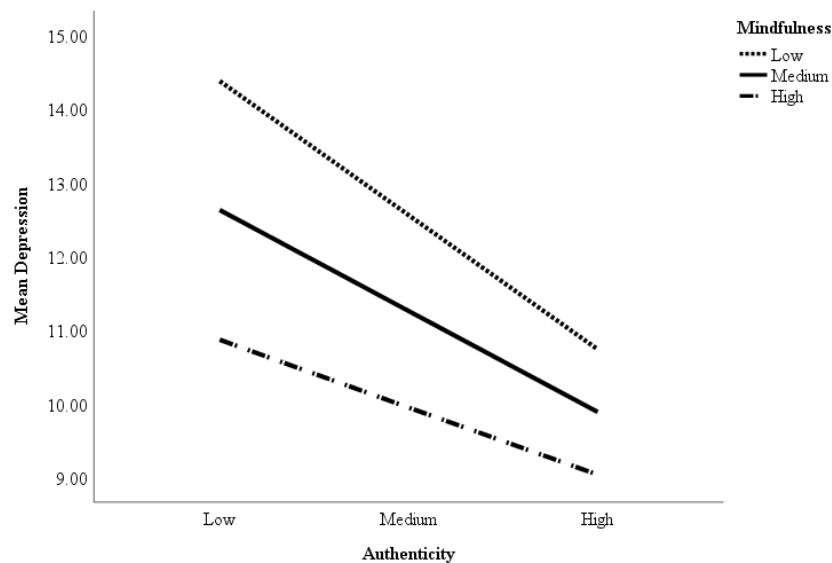
Note. M=Mean; SD=Standard deviation. Cronbach's alpha is presented in parentheses.

** $p<.01$

A statistically significant interaction was found between authenticity and mindfulness in the full regression model $F(3,252)=33.92, p<.001, R^2=.29$. To visualise findings, the interaction was deconstructed into “high” (+1SD) and “low” (-1SD) levels of centred scores from continuous predictors to yield depression scores (Hayes, 2017) (Figure 1). Authenticity has an effect on depression under all levels of mindfulness but mindfulness has the strongest buffering effect on levels of depression when levels of authenticity are low (low: $b= -.26, 95\% \text{ CI } [-.37; -.15], t=-4.71, p<.001$; medium: $b= -.19, 95\% \text{ CI } [-.28; -.11], t=-4.41, p<.001$; high: $b= -.13, 95\% \text{ CI } [-.24; -.03], t=-2.44, p<.05$).

Figure 1

Depression on authenticity by mindfulness. Low and high levels of continuous predictors equal ± 1 SD of centred scores.



Discussion

This study examined the moderating role of mindfulness on the relationship between authenticity and depression. Authenticity and mindfulness were both significantly and negatively associated with depression, which aligns with the existing body of literature

(Abbasi et al., 2020; Grijak, 2017; Krägeloh et al., 2019; Vorontsova-Wenger et al., 2020). Moreover, it was found that high levels of mindfulness were able to buffer the negative effect of inauthenticity on depression. These results indicate that highly mindful individuals may be able to be accepting and nonjudgmental of the fact that they are not presenting their true self in the present moment, which is associated with lower levels of depression.

These findings have important implications regarding the alleviation of poor mental health and depression. Firstly, being authentic by having a high level of self-awareness and being able to express one's true self may be beneficial in terms of mental health. Authenticity may be enhanced with targeted interventions that encourage self-exploration and identification of values and reflection, similar to programmes that are designed for authentic leadership development (Baron, 2012). Secondly, it is acknowledged that various life and role demands do not always allow or enable one to be one's true self (Sutton, 2018). In such circumstances, engaging in mindfulness practice may help to deal with negative feelings that arise due to feelings of inauthenticity. Mindfulness training has repeatedly shown positive effects with regards to decreases in distress and depression (Carmody & Baer, 2009; Abbasi et al., 2020).

This study has a few limitations. Firstly, it is cross-sectional in nature and does therefore not allow causal interpretations of findings. Future research needs to investigate mindfulness and authenticity in intervention studies to establish causal relationships. Secondly, while the demographics of the sample represent a predominantly Western or individualistic culture, 20.7% (Asian and Māori) indicated an ethnicity that is likely to have more collectivist cultural values. A recent meta-analysis demonstrated that collectivism may slightly reduce the strength of the positive relationship between authenticity and well-being and this may be due to the use of predominantly individualistic measures of the concepts (Sutton, 2020). By the same

token it has to be acknowledged that depression measured through the DASS-21 may not reliably capture levels of depression in individuals from a collectivistic culture. Chen and Murphy (2019) found evidence that there are cross-cultural differences in the way authenticity and mindfulness relate to well-being. While authenticity was only a partial mediator between mindfulness and well-being for people from an individualistic culture, authenticity was a full mediator between mindfulness and well-being for people from a collectivistic sample. Levels of authenticity therefore seem to have a bigger role in the relationship between mindfulness and mental health for collectivistic than individualistic cultures in that study. A comparison of the relationship between authenticity, mindfulness and depression between individualistic and collectivistic cultures including culturally appropriate measurement of those should therefore be addressed in future research..

The results indicated that only 29% of the variance in depression is explained by authenticity and mindfulness suggesting that other sociocultural variables may play an important role in this relationship. However, our sample did not include social and cultural groups of sufficient size that would allow valid cross-cultural comparisons. Future research should also take other sociocultural variables into consideration that may affect this relationship, because collectivistic and individualistic cultures may have different motivations regarding the enhancement of self-regard. While positive attributions to the self are seen as a source of worth in individualistic cultures, it is less the case in collectivistic cultures where the fulfilment of social expectations is emphasised more dominantly (Chen & Murphy, 2019) and could equally affect mental health outcomes in these cultures.

Thirdly, we did not assess specific employment details such as the size of the organisation, the type of employment agreement or where individuals are in the hierarchy of the organisation, which could possibly have an impact on mental health as

well. Lastly, this study examined depression as an outcome variable, but it will be valuable to include more health-related outcome variables in future studies to gain a broader picture of how authenticity and mindfulness may work together to achieve better health.

In summary, this study has shown that both authenticity and mindfulness are important with respect to mental health and that mindfulness may be able to buffer the negative impact of inauthenticity.

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Chapter Three

Mindfulness and Readiness for Change

Paper title and publication status:

Roemer, A., Sutton, A., & Medvedev, O. N. (2021). The role of dispositional mindfulness in employee readiness for change during the COVID-19 pandemic.

Journal of Organizational Change Management. Online First.

<https://doi.org/10.1108/JOCM-10-2020-0323> [Impact factor: 0.96]

Publisher: Emerald Publishing Limited

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Abstract

Purpose: The coronavirus disease 2019 (COVID-19) pandemic has forced organisations to change the way they work to maintain viability, even though change is not always successfully implemented. Multiple scholars have identified employees' readiness for change as an important factor of successful organisational change, but research focused on psychological factors that facilitate change readiness is scarce. The aim of the present study was to investigate whether employee dispositional mindfulness contributes to readiness for change.

Method: Employees ($n = 301$) from various industries in New Zealand participated in an online survey shortly after the local COVID-19 lockdown ended. The employees' levels of mindfulness, readiness for change, well-being, and distress were assessed using well-validated psychometric scales. Multiple regression analyses tested the effect of mindfulness on readiness for change, with well-being and distress as moderating variables.

Findings: The results show that the effect of mindfulness on readiness for change is moderated by both well-being and distress. Mindfulness has a positive, significant effect on readiness for change when levels of well-being are high and levels of distress are low.

Originality: This study provides empirical evidence that dispositional mindfulness may facilitate the employees' readiness for change, but only when levels of well-being are high and distress are low.

Practical implications: These findings have important implications for organisations

who aim to promote readiness for change in their employees. Even though mindfulness has been shown to be beneficial, organisations also have to consider the mental states of their employees when managing change.

Keywords: Readiness for change, mindfulness, well-being, distress, organisational change

Introduction

The current coronavirus disease 2019 (COVID-19) pandemic has not only caused many changes in the private life of many individuals, but it also forced organisations to change the way they operate (World Health Organization, 2020). Strict hygienic rules have been put in place, and social distancing requirements have changed the way teams work together and how business is conducted with clients. Many of these changes include remote working and increased usage or implementation of novel technology and software (Semple and Cherrie, 2020). In order to ensure that organisations can operate as effectively as possible under these circumstances, it is necessary that all employees commit to the changes they face in their jobs.

Even though organisations have to deal with change frequently, a high number of change initiatives fail (Burnes, 2011), very often due to employee resistance to change (Amarantou *et al.*, 2018). The challenge of successful change raises the question of how organisations can manage and facilitate organisational change more effectively. Management and business scholars have dedicated a lot of attention to processes, strategy and context-related factors that are relevant for organisational change (Bouckennooghe *et al.*, 2009; Holt *et al.*, 2007; Straatmann *et al.*, 2016), but a major contributor to the success of change are the change recipients' reactions, beliefs, and attitude towards the change (Oreg *et al.*, 2011), which indicate employee readiness for change (Bouckennooghe, 2010). Employee resistance to change can therefore be targeted by working on employee attitudes and perceptions (Amarantou *et al.*, 2018) and thus creating readiness for change.

Employee readiness for change reflects the recipients' reactions and beliefs on an affective, behavioural and cognitive level and has been identified as an important component of successful organisational change (Armenakis, *et al.*, 2007; Bouckennooghe, 2010; Bouckennooghe *et al.*, 2009; Holt *et al.*, 2007). The anticipated

benefits of a change project for instance, are associated with change-supportive behaviour (Kim *et al.*, 2011). While the affective component refers to the change recipient's emotions regarding change, the behavioral component captures the employee's intentions to support and commit to the change. The cognitive component encompasses the employee's beliefs regarding the need and usefulness of change, e.g. whether the employee thinks that the change will benefit the organisation (Bouckennooghe, 2010; Bouckennooghe *et al.*, 2009). Higher levels of change readiness are negatively related to intentions to leave the organisation and absenteeism (Chênevert *et al.*, 2019), which ensures that organisations can retain the human capital they need to navigate through change. Moreover, employee readiness for change is associated with better organisational performance (Imam *et al.*, 2013), which contributes to organisational outputs in times of change. Increasing employee readiness for change is therefore invaluable for successful organisational change. A promising construct that might potentially enhance employee change readiness and which has only received a minimal amount of attention is mindfulness (Gärtner, 2013; Gondo *et al.*, 2013).

Mindfulness reflects a natural and adaptive capacity of human awareness and attention and its cultivation was originally emphasised in Buddhism and other Eastern contemplative traditions (Kang and Whittingham, 2010). Drawing from Eastern traditions, mindfulness involves a non-reactive awareness of the present moment, observing and paying attention to stimuli and inner reactions without assigning labels to them (Good *et al.*, 2016). Another implication of mindfulness is that one is open and accepting of all thoughts, feelings and sensations one comes across. Being accepting of one's experiences may result in less discomfort when experiencing unpleasant emotions and increases one's level of tolerance (Bishop *et al.*, 2004). A very important mechanism of mindfulness is the one of re-perceiving, which is the "capacity to dispassionately observe or witness the contents of one's consciousness" (Shapiro *et al.*,

2006, p. 381). Reperceiving enables individuals to be more objective, non-reactive, and observational regarding their feelings, thoughts, and experiences, allowing them to respond to a situation mindfully and not automatically. This ability to step back from feelings and thoughts gives one more freedom to act, which works in favour of better self-regulation and more flexible behaviour (Shapiro *et al.*, 2006). Self-regulation refers to processes that involve the adjustment of an individual's affective, behavioural, and cognitive responses in order to achieve goals (Boekaerts *et al.*, 2005). Considering that readiness for change also involves affective, behavioural and cognitive components, it becomes clear that effective self-regulation may be a key element in successfully dealing with change. Mindfulness promotes self-regulatory behaviour (Brown and Ryan, 2003) and research has shown that mindfulness can be developed and enhanced through interventions (Krägeloh *et al.*, 2019), which is of value to organisations who aim to prepare employees for change. Mindfulness thus presents a capacity that deserves further attention in the process of promoting organisational change.

Mindfulness has already been shown to be a useful psychological resource in workplace settings. For instance, Dane and Brummel (2014) investigated the impact of being mindful in a dynamic work environment and found that being present in the moment and being able to pay full attention to various stimuli and events was positively related to performance at work. Moreover, mindfulness is also positively associated with creativity, affective commitment, job satisfaction and engagement (Andrews *et al.*, 2014; Byrne and Thatchenkery, 2019; Malinowski and Lim, 2015; Zivnuska *et al.*, 2016). Zivnuska *et al.* (2016) argue that mindfulness enables employees to recognise and respond to various stimuli and situations more appropriately and it provides access to other psychological resources, which may work in favour of well-being and positive job-related attitudes. By the same token, mindfulness has been found to be negatively related to turnover intentions (Andrews *et al.*, 2014; Dane and Brummel, 2014;

Zivnuska *et al.*, 2016) and counterproductive behaviour (Krishnakumar and Robinson, 2015; Schwager *et al.*, 2016).

In addition to the above, mindfulness may also improve change readiness in several ways. Firstly, mindfulness involves the reduction of automatic responses to external and internal stimuli, allowing individuals to observe their reactions, feelings and mental processes, and evaluate whether they are subject to bias and inaccuracy from previous experience or attitudes (Gärtner, 2013, Good *et al.*, 2016). Mindful employees are therefore expected to exhibit a greater level of flexibility in their attitudes and behaviour than less mindful employees, who react and behave as a result of automaticity (Gärtner, 2013; Shapiro *et al.*, 2006). This flexibility may enable them to better deal with a changing world at all levels.

Secondly, in order to efficiently draw from psychological resources to deal with change and self-regulate accordingly, employees need to be aware of situations that require them to adjust their behaviour and be able to detect thinking patterns that do not contribute to the achievement of goals and targets (Avey *et al.*, 2008). Those with a higher level of mindfulness may be better able to identify situations that require adjustment of behaviour. Moreover, they may also be able to identify counterproductive thinking patterns and therefore show greater readiness for change through better self-regulation (Avey, *et al.*, 2008).

Thirdly, employees who face change often experience fear and stress (Mack *et al.*, 1998; Mosadeghrad and Ansarian, 2014). Higher mindfulness entails being nonjudgmental and nonreactional to inner experiences. Even though employees might not like the change and experience some negative feelings, they might still be able to see the necessity of this change and be more willing to commit (Gärtner, 2013). Taking all points mentioned into account, mindfulness, operationalised as a construct that characterises individuals as being observational, descriptive, nonjudgmental,

nonreactional and aware of their feelings, thoughts and actions, has the potential to enhance readiness for change.

While mindfulness has been shown to be effective regarding desirable organisational outcomes, there remain concerns regarding the use of mindfulness as a tool to optimise business operations (Hülshager, 2015). Due to its increased popularity and media coverage, mindfulness is now often seen as a quick fix to various health and performance-related issues in organisations (Hyland, 2015). Even though mindfulness may have shown benefits for employees and organisations, there is the risk that mindfulness is regarded as a solution for all problems without considering other organisational and individual factors that may need to be addressed more specifically (Hülshager, 2015). This point also raises the question of which factors influence whether mindfulness has a positive effect on relevant outcome variables such as readiness for change.

One of these factors is likely to be employees' current state of mental health. Dealing with changes at work is a task that may require self-regulation (Kuntz and Gomes, 2012; Wood, 2005). Research indicates that each person's self-regulation resources are limited (Chan and Wan, 2012) and that distress and well-being may influence the availability of these resources. Distress is thought to interfere with self-regulation because affect regulation is prioritised over other forms of self-regulation (Baumeister *et al.*, 2007). On the other hand, well-being may promote self-regulatory behaviour and thereby increase readiness for change, because positive affect contributes to greater flexibility in cognitive and behavioural processes and therefore facilitates self-regulation (Aspinwall, 1998). Mindfulness is known to support self-regulation (Brown and Ryan, 2003) and the mental state of employees may therefore be a factor that influences the usefulness of mindfulness in an organisational context. This research

aims to address the question of whether employee mindfulness has a positive impact on readiness for change while controlling for their levels of distress and well-being.

Method

Participants

Cross-sectional data were collected online through a survey panel. Participants were 301 employees from New Zealand with a mean age of 40.48 ($SD=12.53$) years who had worked on average for 6.93 ($SD=7.06$) years in their current job. One hundred and forty-nine (49.5%) participants were male and 152 (50.5%) participants were female. A large majority of participants were NZ European (68.1%), the rest of the sample indicated Asian (13.6%), Māori (7%), Pasifika (1.7%), or Other (9.6%) as their ethnicity. Participants were employed in Healthcare (15%), Education (12.6%), Hospitality (9.3%), Building/Construction (8.3%), Financial/Business Services (6%), Agriculture (5.6%), Retail (5.3%), Manufacturing (4.7%), IT (4.3%), Government (4%), or other fields (24.9%), such as law, transportation, security, media, or automotive. Most participants (71.8%) were able to work at their normal workplace, the rest of the sample was either switching between office work and remote work or were working remotely completely.

Procedure

The authors' University ethics committee granted permission to conduct this study. An online survey was compiled in Qualtrics and was sent to full-time working employees in New Zealand through a survey panel during level 2 of New Zealand's response to the COVID-19 pandemic, where most businesses could operate, but with restrictions in place, such as social distancing and contact tracing measures (New Zealand Government, 2020). Prior to the start of the survey informed consent was obtained from all participants. Participants were informed about the aim of this research and that participation was fully anonymous and voluntary.

Measures

The following self-report measures were used to assess mindfulness, readiness for change, well-being, and distress.

Mindfulness

The Five Facet Mindfulness Questionnaire (FFMQ; Baer *et al.*, 2006) was used to assess mindfulness. The measure consists of 39 items capturing the five mindfulness facets observe, describe, acting with awareness, nonjudge, and nonreact, which can be rated on a 5-point Likert scale (1 = never or very rarely true; 5 = very often or always true). Items were summed to get an overall scale score and higher scores indicate higher levels of mindfulness. The measure showed excellent reliability in the present study ($\alpha=.88$).

Readiness for Change

This construct was assessed using the readiness for change scale from the Organizational Change Questionnaire—Climate of Change, Processes, and Readiness (OCQ-P, C, R; Bouckennooghe *et al.*, 2009). This scale consists of 9 items assessing affective, cognitive, and intentional facets of change readiness and can be rated on a 5-Point Likert scale (1 = strongly disagree; 5 = strongly agree). Questionnaire instructions were tailored to instruct participants to consider changes in their job due to the COVID-19 pandemic. The wording of items has not been changed. All items were summed to yield an overall change readiness score with higher scores indicating a higher readiness for change. The scale exhibited good reliability in the present study ($\alpha=.81$).

Well-being

The Warwick-Edinburgh Mental Well-being Scale (WEMWBS; Tennant *et al.*, 2007) was used to measure well-being. The measure incorporates 14 items that can be rated on a 5-Point Likert scale (1 = none of the time; 5 = all of the time). Item scores were summed and higher scores indicate a higher level of well-being. The WEMWBS

was found to be very reliable in the present study ($\alpha=.93$).

Distress

The Depression, Anxiety and Stress Scale (DASS-21; Lovibond and Lovibond, 1995) was used to assess distress. The scale consists of 21 items, which can be rated on a rating scale with 4 categories (1 = never, 4 = almost always). All items were summed to get an overall scale score. The scale was found to be very reliable in this study ($\alpha = .95$).

Data Analyses

Data analysis was conducted using IBM SPSS v26. The dataset was screened for participants who completed the survey too quickly. All cases with a completion time faster than 50% of the median time (Greszki *et al.*, 2014) were removed from the dataset to enhance quality of responses, resulting in a final dataset with 256 cases. All variables were acceptable with regards to normal distribution, and skewness and kurtosis did not exceed the recommended conservative range of ± 1 (Muthén and Kaplan, 1985).

Descriptive statistics and Pearson correlation coefficients were calculated to determine relationships between study variables. The PROCESS macro for SPSS (Hayes, 2017) was used to analyse the effect of mindfulness on readiness for change while considering well-being and distress as moderators respectively. For this purpose two multiple regression models were run. Model 1 used mindfulness, well-being and their interaction term as predictor variables, model 2 used mindfulness, distress, and their interaction term as predictor variables for readiness for change. In order to visualise and interpret findings, significant interactions were deconstructed into “high” (+1SD) and “low” (-1SD) levels of centred scores from continuous predictors to create readiness for change scores.

Results

Pearson correlations (see Table 1) revealed a positive relationship between mindfulness and readiness for change $r=.25, p<.01$ and between mindfulness and well-being $r=.49, p<.01$. Mindfulness and distress were negatively correlated $r=-.50, p<.01$. Readiness for change is positively related to well-being $r=.36, p<.01$ and negatively related to distress $r=-.23, p<.01$.

Table 1

Pearson correlation matrix between the FFMQ total score (mindfulness), the readiness for change scale total score, the WEMWBS total score (well-being), and the DASS-21 total score (distress).

	<i>M</i>	<i>SD</i>	1	2	3	4
1. Mindfulness	127.58	16.94	(.88)			
2. Readiness for change	32.12	4.90	.25**	(.81)		
3. Well-being	48.95	9.21	.49**	.36**	(.93)	
4. Distress	35.13	11.96	-.50**	-.23**	-.57**	(.95)

Note: *M*=Mean; *SD*=Standard deviation. Cronbach's alpha is presented in parentheses.

** $p<.01$

Figure 1

Readiness for change on mindfulness by well-being. Low and high levels of continuous predictors equal $\pm 1SD$ of centred scores.

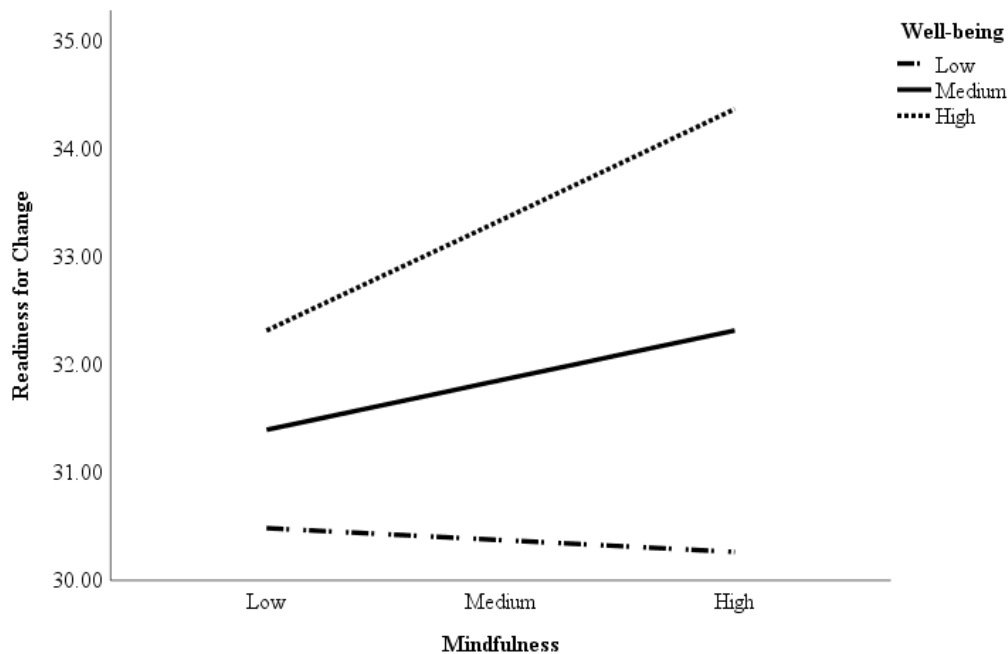
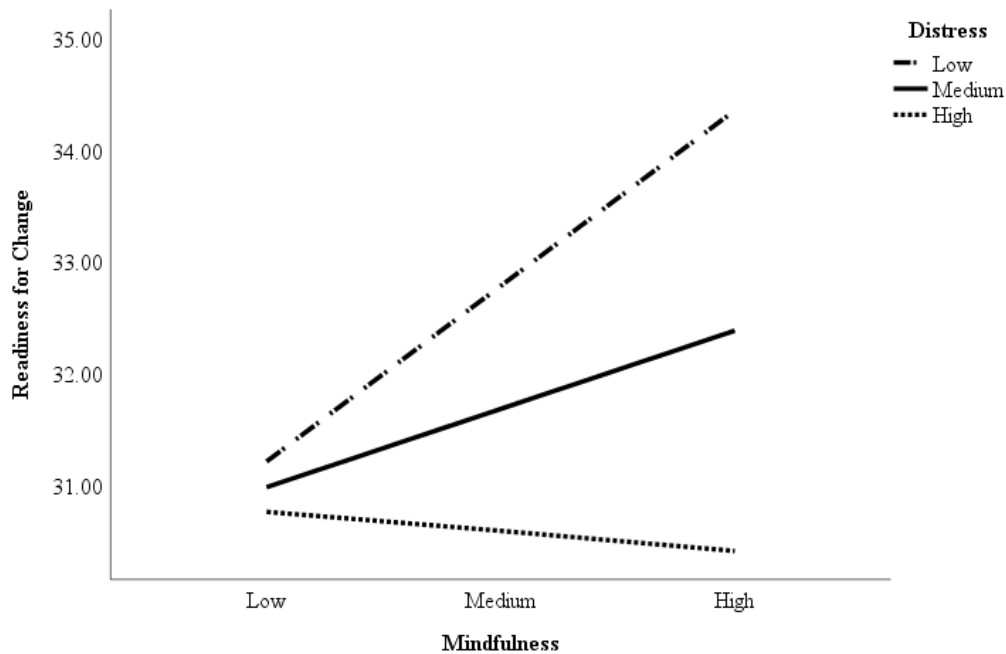


Figure 2

Readiness for change on mindfulness by distress. Low and high levels of continuous predictors equal ± 1 SD of centred scores.



Two multiple regressions were run to analyse the impact of mindfulness on change readiness while considering a moderating effect of well-being and distress. Figures 1 and 2 visualise the effects that were found. A statistically significant interaction was found between mindfulness and well-being in the first regression model $F(3,252)=15.23, p<.001, R^2=.15$. To aid in interpretation, the interaction terms are visualised in Figure 1 using low, mean and high levels of well-being. When well-being is low, visualised as the lower dashed line, there is no effect of mindfulness on readiness for change, $b= -.01, 95\% \text{ CI } [-.056; .044], t=-0.25, p=.80$. At mean levels of well-being, visualised as the center line, the effect of mindfulness on readiness for change is also not significant $b=.03, 95\% \text{ CI } [-.011; .065], t=1.41, p=.16$. When levels of well-being are high, visualised as the upper dashed line, mindfulness has a positive, significant effect on readiness for change $b=.06, 95\% \text{ CI } [.013; .108], t=2.50, p<.05$.

A statistically significant interaction was also found between mindfulness and

distress in the second regression model $F(3,252)=10.15, p<.001; R^2=.11$. This interaction is visualised in Figure 2. It shows that when levels of distress are low, shown as the upper dashed line, mindfulness has a positive, significant effect on readiness for change $b=.09, 95\% \text{ CI } [.045; .141], t=3.81, p<.001$. At mean levels of distress, visualised as the center line, mindfulness also has a positive, significant effect on readiness for change $b=.04, 95\% \text{ CI } [.003; .081], t=2.04, p<.05$. But when levels of distress are high, visualised as the lower dashed line, mindfulness does not have a significant effect on readiness for change anymore $b= -.01, 95\% \text{ CI } [-.069; .049], t= -0.34, p=.74$.

Overall, our results indicate that a significant moderating effect is evident in both regression models. Higher levels of mindfulness are positively associated with readiness for change, but only when well-being levels are high and distress levels are low. This shows that the mental health of employees is just as important as their level of mindfulness when it comes to showing readiness for change.

Discussion

The COVID-19 pandemic is forcing many organisations to change the way they operate, and consequently a large number of employees face changes in their jobs. It is important that employees commit to those changes and show readiness for change, which is a contributor to successful organisational change (Oreg *et al.*, 2011). The aim of the present study was to investigate to what extent the psychological construct of mindfulness may help to facilitate the employees' readiness for change.

It was found that the employees' level of well-being and distress acted as moderators in the relationship between mindfulness and readiness for change. Only when levels of well-being were high, or levels of distress were low, did mindfulness have a positive effect on readiness for change. While mindfulness promotes self-regulation (Brown and Ryan, 2003) and dealing with organisational change may require

self-regulation (Kuntz and Gomes, 2012; Wood, 2005), it seems that the employees' mental state also has an impact on the effectiveness of mindfulness on change readiness.

To the best of the authors' knowledge, there is no research that investigated how well-being and distress may moderate effects of mindfulness in the context of organisational change. However, there are findings from organisational psychology, which highlight that stress may compromise self-regulation and employee performance. For instance, Chan and Wan (2012) found that employees who experience high stress suffer from higher levels of fatigue and show worse performance in tasks that require self-regulation. With respect to the present research, it is therefore possible that even mindful employees working under pressure may experience a higher degree of distress and feel too exhausted and fatigued to successfully engage in self-regulatory behaviour and thus do not show higher readiness for change. Furthermore, organisational stressors could be appraised as either a challenge or a threat. While challenge appraisal leads to more engagement, threat appraisal leads to self-regulation depletion (Mitchell *et al.*, 2019). It is plausible that highly mindful employees who do not suffer from distress and feel mentally well are more likely to regard organisational change as a challenge and can exercise adequate self-regulatory behaviour. Employees with higher levels of mindfulness but also higher levels of distress might experience organisational change as more threatening, which depletes their capacity for self-regulation.

Implications

This study's findings have several implications for organisations, change practitioners and researchers who aim to use mindfulness for managing organisational change. Firstly, this research adds to the discussion around the appropriateness of mindfulness interventions in organisations (Hülshager, 2015; Hyland, 2015). Mindfulness interventions should not be regarded as a tool that can address all problems at once. While mindfulness may promote the readiness for change of employees whose

well-being levels are not compromised, it might not be helpful to address the change readiness of employees with mindfulness who experience distress. It would be a priority to address the distress levels of these employees first before expecting them to be able to fully commit to change. For instance, it was shown that supervisor support could replenish depleted resources of stressed employees (Chan and Wan, 2012). This finding also aligns with the body of literature in change management, which suggests that leadership and supervisor support are important predictors of readiness for change (Kirrane *et al.*, 2016; Straatmann *et al.*, 2016).

Our findings also highlight the importance of controlling for individual differences when conducting future studies analysing the impact of mindfulness on change readiness, especially when aiming to use interventions. Previous work has shown that individuals' dispositional mindfulness and well-being levels may impact the effectiveness of a mindfulness-based intervention (Roemer *et al.*, 2021) and the present study indicates that individual levels of well-being also influence change readiness. Researchers should keep this in mind when designing and evaluating interventions, as they may not work for everyone. Organisations often prefer to apply short mindfulness training over long mindfulness training sessions because it is more practical in terms of cost and time (Jamieson and Tuckey, 2017). While short interventions may work with healthy participants, participants that experience low levels of well-being and high levels of distress may possibly need longer interventions (Roemer *et al.*, 2021).

The findings of this study have also important implications for society as a whole. Change is an inevitable feature of our daily lives and rather a norm than an exception (Mack *et al.*, 1998) and continuous change is a necessity for many organisations to survive (Burnes, 2011). Examples of such change include but are not limited to advances in technology, globalisation, climate change, and/or responding to events such as the COVID-19 pandemic. This requires individuals representing the

society to be mindful and show awareness of situations where change is needed while being accepting of the fact that change could sometimes be the most viable option, even though it might not be easy or pleasant

Limitations and directions for future research

This study has a few limitations that need to be acknowledged. Firstly, this was a cross-sectional study and results are therefore correlational in nature. This study should therefore be replicated with two assessment points a few weeks apart or using an experimental design to be able to draw causal conclusions. Considering this limitation, it may be valuable to assess the effectiveness of mindfulness training in an organisation when managing change. This would be another approach that allows drawing causal conclusions.

Secondly, it was found that well-being and distress acted as moderating variables and thus influence the effectiveness of mindfulness on readiness for change. Future research could assess and identify more variables that may determine the effectiveness of mindfulness with regards to readiness for change. It is possible that other individual factors concerned with health, personality or psychological resources, such as resilience and optimism, may also play a significant role with respect to one's readiness for change.

Thirdly, the present sample consisted of employees from various organisations and industries and it is not known whether some of those participants were working for the same organisation. Collecting data from multiple organisations with multiple of their employees would allow the application of stronger statistical approaches such as multilevel modelling to account for variance that occurs due to the fact that certain employees belong to the same organisation. Finally yet importantly, the current study was run during a global pandemic and the change readiness measure referred to changed due to COVID-19. This is an exceptional, unprecedented situation and results may not

be generalisable to other forms of organisational change in normal circumstances. This, however, has an exceptional advantage as findings of this study conducted during pandemics are likely applicable in various emergency conditions that may occur in the future without warning, which is a manifestation of impermanence - a default condition of our existence.

Conclusion

This study provided preliminary empirical evidence that mindfulness may be beneficial with regards to the readiness for change of employees. Mindfulness might therefore be a possible tool to help employees dealing with organisational change. While this is an important finding for organisations and individuals initiating an adaptive change, the study also highlights the importance of considering employees' current mental health when aiming to use mindfulness for managing change. Employees may struggle to deal with change due to reduced capacity for self-regulation when they experience distress and compromised well-being. It is therefore also important to address mental health issues to assist employees with the challenge of change.

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Chapter Four

Effectiveness of a Low-dose Mindfulness-based Intervention on Attentional Performance and Well-being

Paper title and publication status:

Roemer, A., Sutton, A., Grimm, C., Kimber, S., & Medvedev, O. N. (in preparation).

Impact of a low-dose mindfulness-based intervention on attentional performance
and well-being in Navy Junior Officers.

Abstract

Mind wandering is common during daily activities and is even more prevalent when stressed, which could ultimately lead to lapses in attention and poor performance. Newly recruited military personnel who undergo demanding military training often experience high levels of stress. It is therefore imperative to find ways to foster mental health and avoid performance deterioration related to mind wandering in times of intense military training. This study aimed to investigate the effectiveness of a low-dose mindfulness-based intervention (MBI) on mind wandering, attentional performance, distress, and well-being. A sample of newly recruited Royal New Zealand Navy (RNZN) Junior Officers (n=24) undergoing demanding training participated in an 8-week long MBI with one weekly contact session. Measures of distress and well-being as well as the Sustained Attention to Response Task (SART) were completed four weeks prior to the MBI, at the start of the MBI, at the end of the MBI and four weeks after completion of the MBI. Results suggest that the MBI might protect from performance decline and even enhance levels of well-being at follow-up. These findings suggest that it may be valuable to include mindfulness as a component in military training for new personnel.

Keywords: Mindfulness-based intervention, sustained attention, well-being, distress, military training

Introduction

When doing daily activities, such as driving, reading or executing tasks at work, our attention to the task at hand tends to drift away and shifts to thoughts that are not related to what we are doing in the present moment. This phenomenon is called mind wandering, defined as stimulus-independent and task-unrelated thoughts (Stawarczyk et al., 2012). Forty-two percent of employees report that they experience problems focusing on tasks at work (Hougaard, 2020) and findings from an experiential study even suggest that 30% of people experience mind wandering during every reported activity (Killingsworth & Gilbert, 2010).

Attentional lapses associated with mind wandering can have negative, even disastrous consequences. This can be the case in aviation (Jones & Endsley, 1996), health care (Fore & Sculli, 2013), or the military (Jha et al., 2015) when individuals are required to suddenly adjust behaviour but do not manage to do it, for instance if pilots fail to react to a technical emergency, nurses do not correctly apply medication to patients in a deteriorating condition, or deployed soldiers accidentally harm civilians while in a conflict zone. Considering that mind wandering is more often reported when experiencing stress (Crosswell et al., 2020), it is important to address mind wandering in highly demanding and stressful professions to prevent negative performance outcomes. Jha et al. (2015) for example found that military personnel going through stressful predeployment training showed more attentional performance lapses over time.

Subjective, self-reported mind wandering statistics are high (Killingsworth & Gilbert, 2010), but it is likely that they underestimate the actual frequency of mind wandering in everyday life. Mind wandering reflects disengagement of attention from perception as well as a lack of meta-awareness, which is the individual's lack of knowledge of current thoughts (Schooler et al., 2011). It is therefore likely that individuals cannot accurately capture and report their own mind wandering and that it

probably happens even more often than self-report studies indicate. Computer-based programmes such as the Sustained Attention to Response Task (SART; Robertson et al., 1997) are frequently used as an additional objective measure of mind wandering and attentional performance (Jha et al., 2015; Zanesco et al., 2019). Sustained attention is referred to “as the ability to self-sustain mindful, conscious processing of stimuli whose repetitive, non-arousing qualities would otherwise lead to habituation and distraction to other stimuli” (Robertson et al., 1997, p.747). If attention is not sustained, individuals fail to respond to stimuli change, which can be considered an attentional lapse (Jha et al., 2015) and greater variation in response reaction times when responding to changing stimuli is a valid indicator of mind wandering (Seli et al., 2013).

Considering the frequency of mind wandering and its potential negative performance consequences, it would be useful to find ways that help to reduce mind wandering, especially in stressful situations. Sustained attention involves being mindful (Robertson et al., 1997) that is, being aware of present moment experiences (Kabat-Zinn, 2003). Mindfulness was found to be negatively correlated with both subjective self-report measures, and objective measures of mind wandering (Mrazek et al., 2012). Mindfulness-based interventions (MBIs) may therefore be a way to reduce mind wandering.

Many MBIs applied in workplace settings are based on the principles of mindfulness-based stress reduction (MBSR) programmes (Kabat-Zinn, 1990), which are rather time-consuming, involving a weekly 2.5-hour contact session, 45 minutes of home practice on six days a week and often a full-day retreat (Jamieson & Tuckey, 2017). It might be difficult to implement this protocol in demanding and busy jobs, therefore shorter, similarly effective MBI protocols are desirable. Several studies have found that abbreviated, low-dose protocols show positive results in terms of attentional performance. For example, an 8-hour MBI distributed over 8 weeks showed positive

effects on attentional performance in military cohorts undergoing demanding military training. Participants who received the MBI did not show a decline in performance on the SART over time, compared to worse performance of participants who received no MBI or didactic-focused mindfulness training (Jha et al., 2015). These results indicate that MBIs may protect participants in highly demanding working conditions from performance deterioration over time. Recent research shows that a 4-week MBI with weekly 2-hour sessions can even enhance performance on the SART compared to a 2-week MBI group and a control group (Zanesco et al., 2019).

The effect of mindfulness training on attentional performance and mind wandering has mostly been conducted with groups exposed to demanding work situations who are already fairly skilled and trained, such as elite soldiers (Zanesco et al., 2019) or athletes (Rooks et al. 2017). However, individuals who are new to a profession and receive intensive training to acquire the skills and experience needed also experience high levels of stress, especially new military recruits who enter a completely new environment that is disconnected from their family and other established support networks (Cigrang et al., 2000). In this critical stage of professional training it is important to support mental health and performance to avoid early dropouts. Mindfulness training was found to have positive effects on stress of new army recruits (Guo et al., 2019) and unemployed youth attending an intensive armed forces bootcamp (Roemer et al., 2021), but research assessing the impact of mindfulness on attentional performance is still minimal. For example, while one study found that nursing and medical students benefitted from a standard-length MBI and a 1-month mindfulness retreat with regards to improved attention-related behavioural responses (Jha et al., 2007), it did not contain a follow-up assessment analysing whether effects could be sustained over time.

Stress and demanding working conditions are associated with more mind

wandering and weaker attentional performance. Considering that military trainees often experience demanding environments, effective interventions for reducing stress, enhancing well-being and improving performance and mind wandering are needed. This study aims to examine the effects of a low-dose MBI with a sample of Royal New Zealand Navy (RNZN) Junior Officers (JOs) in training and determine whether potential effects can be sustained even after intervention completion.

Method

Participants

Participants were 24 newly recruited JOs of the RNZN who were undergoing the Junior Officer Common Training (JOCT), which is a demanding 6-month training programme to prepare them for military service in the RNZN. The mean age of the sample was 24 years ($SD=8.47$) and 63% were male. Only participants were included in the analysis who completed measures at all assessment points, resulting in a final sample of $n=17$.

Ethics

Ethical approval for this research was given by the authors' institutional ethics committees. While an MBI was incorporated as part of the JOCT programme, participation in the research element was voluntary, entirely anonymous and participants could withdraw at any point. In order to be able to match data across time points while ensuring anonymity, participants were asked to create a unique code consisting of their parents' initials and their day of birth.

Procedure

The JOCT is a 6-month long course and the MBI was delivered during in months 3 and 4. Psychological measures as well as the SART were administered at four time points: Four weeks prior to the start of the MBI (T1), immediately prior to the MBI (T2), upon completion of the 8-week MBI (T3), and a follow-up assessment four weeks

after completion of the MBI (T4). All psychological measures were administered using a paper and pencil format and the SART was conducted via laptops using the open source software package PsychoPy.

The MBI was delivered by a trained mindfulness instructor over a period of 8 weeks with one weekly 1-hour class and 15 - 20 minutes of daily homework practicing mindfulness. The MBI followed Jha et al.'s (2020) Mindfulness-Based Attention Training (MBAT) protocol, which is a manualized program initially developed for military populations (Denkova et al., 2020). This protocol contains four central themes that have corresponding mindfulness exercises. The first theme to be introduced is *concentration*, which includes a guided concentration meditation asking participants to focus on their breathing, and return their attention back to their breathing when mind wandering is observed. The second theme is *body awareness*, which is trained through a guided body scan, instructing participants to notice any sensations in the body while being non-judgmental of any sensations that arise. The third theme is *open monitoring*, which aims to enhance awareness and receptiveness to changing circumstances and asks participants to expand their level of awareness without a designated object of attention. The last theme is *connection*, which targets relationship and group cohesion by asking participants to engage in the cognitive and emotional intention of kindness and compassion towards oneself and others (Zanesco et al., 2019). The MBAT protocol can be delivered as 4 2-h sessions, or as in this study as 8 1-hr sessions. MBAT differs from other standardised MBI protocols, such as MBSR (Kabat-Zinn, 1990) which delivers 2.5 hours of contact sessions over a period of eight weeks and is therefore considered a low-dose intervention. An illustration of the study design can be seen in Figure 1.

Figure 1
Study design



Measures

Sustained attention

This study used a modified version of the SART as used by Zanesco et al. (2019). Participants were placed in front of laptops and were presented numbers (0-9) for 250ms followed by an inter-trial period presenting a fixation cross for 900ms. They were instructed to press the space bar when any number except number 3 was presented and to refrain from pressing the space bar when seeing number 3. The SART consisted of 27 target (number 3) trials, 519 non-target trials and 28 probe questions. The probe questions consisted of two consecutive, randomly distributed probe questions, forming 14 pairs. They were shown to participants serving the purpose to capture spontaneous moments of mind wandering. Probe 1 asked “Where was your attention focused?” which could be answered on a 6-point Likert scale using the keyboard (1=on task, 6=off task). Probe 2 asked “How aware were you of where your attention was?” which could also be answered using a 6-point Likert scale (1=aware, 6=unaware). Figure 2 illustrates the procedure of the SART.

Participants completed a 163-trial practice block first to familiarise themselves with the task. This practice block was therefore not included in the analysis section. In order to assess performance on the SART three outcomes were investigated, namely

accuracy, reaction time variability, and the probe responses. The index for *accuracy* (A'), was calculated entering the number of hits (correctly withholding from pressing space bar for targets), misses (incorrectly pressing the space bar for targets), false alarms (incorrectly withholding from pressing the space bar for non-targets) and correct rejections (correctly pressing space bar for non-targets) of each participant into the Signal Detection Calculator (v.1.1.1.) provided by Gaetano et al. (2015). The resulting index A' was then entered in SPSS for each participant.

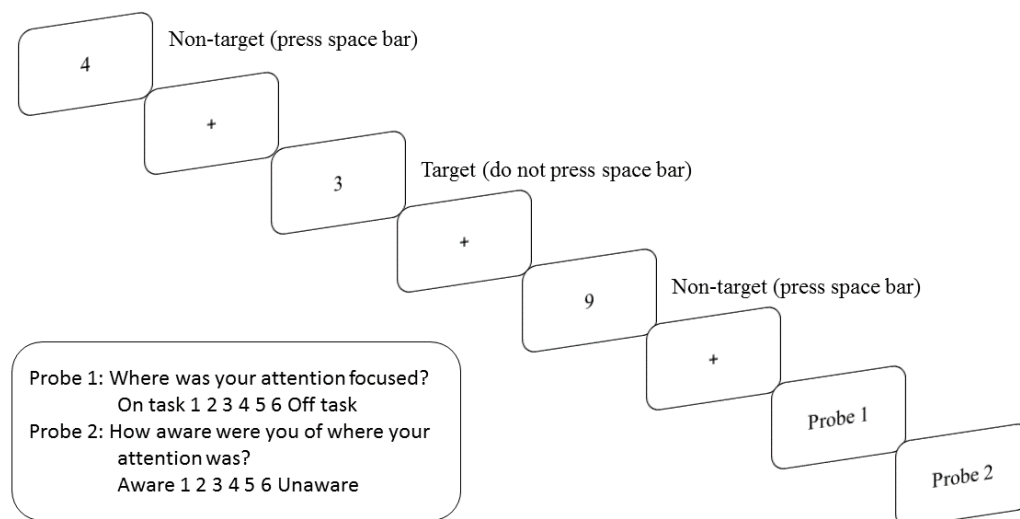
Reaction time variability for each participant was indexed through the intra-individual coefficient of variation (ICV), which is the quotient of the standard deviation of the reaction time of correct non-targets and the mean reaction time of correct non-targets (ZanESCO et al., 2019):

$$\frac{\text{SD reaction time non-targets}}{\text{M reaction time non-targets}}$$

A higher ICV indicates that response times vary to a greater extent. Previous research states that the ICV is a valid objective indicator of mind wandering (Seli et al., 2013). In addition to the ICV, mean scores were calculated separately for the two probe questions and were used as two subjective indicators of mind wandering.

Figure 2

Example illustration of the Sustained Attention to Response Task (adapted from Jha et al., 2015)



Psychological Distress

Psychological distress was measured using the the Depression, Anxiety and Stress Scale (DASS-21; Lovibond & Lovibond, 1995). The measure contains 21 items, which can be rated on a rating scale with 4 categories (0 = never, 3 = almost always). Items were summed to yield and overall score, with a higher score indicating higher levels of distress. The DASS-21 showed good reliability in the present study (α T1=.94, α T2=.93, α T3=.94, α T4=.94).

Well-being

Well-being was measured using the short Warwick Edinburgh Mental Well-being Scale (SWEMWBS; Stewart-Brown et al., 2009). The measure includes seven items and can be rated on a 5-point Likert scale (1 = none of the time, 5 = all of the time). Reliability was good in the present study study (α T1=.75, α T2=.89, α T3=.86, α T4=.90). Items were summed with a higher score indicating higher levels of well-being.

Data analyses

Data analysis was conducted using IBM SPSS v26. All raw scores of the DASS-21 and SWEMWBS were transformed into metric scores for data analysis using Rasch score transformation tables (Medvedev et al., 2020; Stewart-Brown et al., 2009). Rasch analysis allows to transform scales from an ordinal level of measurement to an interval level of measurement, which enhances the precision of measurement (Medvedev et al., 2020). Metric scores were rounded to have full scores with no decimal places for each participant. Descriptive statistics and Pearson correlation coefficients were computed to investigate relationships. The Wilcoxon signed-rank test was used to analyse changes over time by comparing positive and negative differences in scores from T1 to T2, from T2 to T3 and from T3 to T4. The Wilcoxon signed-rank test is a non-parametric test that is particularly suitable for small samples where data do not meet the assumptions for parametric tests (Field, 2013).

Results

Descriptive statistics of the outcome measures as well as correlations for each time point can be found in Tables 1-5. It can be seen that accuracy on the SART is consistently negatively associated with distress levels, but to a lesser degree over time (T1 $r=-.41$, $p=.11$; T2 $r=-.34$, $p=.21$; T3 $r=-.29$, $p=.34$, T4 $r=-.18$, $p=.50$). However, the differences in magnitude of these correlations are not significant. Subjective as well as objective reports of mind wandering assessed via the ICV (T1 $r=-.70$, $p<.01$; T2 $r=-.07$, $p=.79$; T3 $r=-.42$, $p=.09$, T4 $r=-.13$, $p=.63$) and probe questions 1 (T1 $r=-.31$, $p=.23$; T2 $r=-.64$, $p<.05$; T3 $r=-.43$, $p=.11$, T4 $r=-.60$, $p<.05$) and 2 (T1 $r=-.38$, $p=.15$; T2 $r=-.50$, $p=.07$; T3 $r=-.20$, $p=.49$, T4 $r=-.56$, $p<.05$) are also negatively associated with accuracy on the SART across most occasions.

Table 1

Descriptive statistics with mean and standard deviation for the outcome measures across four time points

	T1	T2	T3	T4
Accuracy A'	.86 (.15)	.91 (.12)	.90 (.14)	.84 (.19)
ICV	.59 (.28)	.46 (.22)	.50 (.24)	.53 (.21)
MW probe 1	2.65 (1.35)	2.51 (1.29)	2.45 (1.00)	2.79 (1.43)
MW probe 2	2.27 (0.93)	2.43 (1.25)	2.39 (1.36)	2.69 (1.41)
Distress	24.30 (8.29)	18.19 (11.85)	19.41 (10.49)	18.17 (13.69)
Well-being	22.57 (4.39)	24.85 (4.99)	24.07 (3.92)	26.51 (4.45)

Note. Calculation of A' and the ICV explained in the method section; MW=Mind wandering, probe 1 and 2 reflect mean scores respectively; Distress (DASS-21); Well-being (SWEMWBS)

Table 2

Correlations between outcome measures at T1

	Accuracy	ICV	Probe 1	Probe 2	Distress
ICV	-.70**				
MW probe 1	-.31	.21			
MW probe 2	-.38	.22	.66**		
Distress	-.41	.00	.05	.03	
Well-being	.15	.12	.25	.14	-.69**

** $p < .01$, * $p < .05$

Note. Calculation of A' and the ICV explained in the method section; MW=Mind wandering, probe 1 and 2 reflect mean scores respectively; Distress (DASS-21); Well-being (SWEMWBS)

Table 3

Correlations between outcome measures at T2

	Accuracy	ICV	Probe 1	Probe 2	Distress
ICV	.07				
MW probe 1	-.64*	.41			
MW probe 2	-.50	.38	.79**		
Distress	-.34	-.18	.32	.04	
Well-being	.11	-.04	-.42	-.15	-.52*

** $p < .01$, * $p < .05$

Note. Calculation of A' and the ICV explained in the method section; MW=Mind wandering, probe 1 and 2 reflect mean scores respectively; Distress (DASS-21); Well-being (SWEMWBS)

Table 4

Correlations between outcome measures at T3

	Accuracy	ICV	Probe 1	Probe 2	Distress
ICV	-.42				
MW probe 1	-.43	.42			
MW probe 2	-.20	.23	.80**		
Distress	-.29	-.03	.12	.34	
Well-being	.18	-.04	-.05	-.21	-.81**

** $p < .01$, * $p < .05$

Note. Calculation of A' and the ICV explained in the method section; MW=Mind wandering, probe 1 and 2 reflect mean scores respectively; Distress (DASS-21); Well-being (SWEMWBS)

Table 5
Correlations between outcome measures at T4

	Accuracy	ICV	Probe 1	Probe 2	Distress
ICV	-.13				
MW probe 1	-.60*	.30			
MW probe 2	-.56*	.27	.97**		
Distress	-.18	-.46*	-.03	.05	
Well-being	.01	.29	-.14	-.24	-.70**

** $p < .01$, * $p < .05$

Note. Calculation of A' and the ICV explained in the method section; MW=Mind wandering, probe 1 and 2 reflect mean scores respectively; Distress (DASS-21); Well-being (SWEMWBS)

Table 6
Wilcoxon signed-rank tests across time points for the outcome variables. Values at time points reflect median scores and the Z-value represents the test statistic for the Wilcoxon signed-rank test.

	T1	T2	Z	T2	T3	Z	T3	T4	Z
Accuracy A'	.91	.94	-2.45*	.94	.94	-0.45	.94	.91	-1.65
ICV	.50	.40	-1.93	.40	.47	-0.43	.47	.54	-0.26
MW probe 1	2.48	2.28	-0.68	2.28	2.52	-0.16	2.52	3.00	-0.18
MW probe 2	2.15	1.86	-0.41	1.86	1.81	-0.94	1.81	2.39	-0.03
Distress	24.60	18.68	-1.87	18.68	18.68	-1.02	18.68	25.39	-1.65
Well-being	23.21	24.11	-2.44*	24.11	24.11	-0.69	24.11	25.03	-3.17**

** $p < .01$, * $p < .05$

Note. Calculation of A' and the ICV explained in the method section; MW=Mind wandering, probe 1 and 2 reflect mean scores respectively; Distress (DASS-21); Well-being (SWEMWBS)

Accuracy on the SART significantly improved from T1 (Mdn=.91) to T2 (Mdn=.94), $Z = -2.47$, $p < .05$. No significant change was evident over the period of the intervention from T2 (Mdn=.94) to T3 (Mdn=.94), $Z = -0.45$, $p = .65$. There was also no significant change from T3 (Mdn=.94) to T4 (Mdn=.91), $Z = -1.65$, $p = .09$.

Well-being significantly improved from T1 (Mdn=23.21) to T2 (24.11), $Z = -2.44$, $p < .05$. No significant change in well-being was evident from T2 (Mdn=24.11) to T3 (Mdn=24.11), $Z = -0.69$, $p = .49$. Well-being significantly improved from T3 (Mdn=24.11) to T4 (25.03), $Z = -3.17$, $p < .01$. No significant changes were found for the ICV, the two probe questions, and distress.

Discussion

Mind wandering throughout the day is common, especially when feeling stressed. It can have dire consequences in many jobs, if attention and reactions are compromised. The aim of the current study was to analyse the impact of a low-dose

MBI on attentional performance, mind wandering, well-being and distress in RNZN JOs in training.

Previous research has shown that demanding training can have a negative impact on attentional performance and that an MBI may protect from performance decline (Jha et al., 2015). The findings of the present study also suggest that a low-dose MBI might help to protect from attentional performance decline while undergoing demanding training. Performance in terms of accuracy on the SART remained constant with no significant change at the start of the MBI until the end of the MBI and at the 4-week follow-up. No significant changes for subjective and objective indicators of mind wandering through the probe questions and the ICV were evident. The non-significant results of subjective mind wandering are not surprising considering that individuals are often not aware of their own mind wandering due to a lack of meta-awareness (Schooler et al., 2011) and can probably therefore not accurately report it.

Levels of distress also did not significantly change, but well-being consistently improved over time: even though no immediate improvement was evident upon completion of the intervention, well-being significantly increased at the 4-week follow up. Such delayed well-being effects are also documented in the literature, for instance it was found that an MBI with children had a greater effect reported at a follow-up assessment compared to well-being effects immediately upon completion of the intervention (van de Weijer-Bergsma et al., 2014). Furthermore, delayed intervention effects on anxiety and impulse control at a 2-month follow-up were found in older children (Galvez Tan & Alampay, 2021). A possible explanation for these findings were found in a study which noted that students with higher levels of mindfulness at the start of a semester reported higher well-being at the time of the final semester test due to the tendency to appraise future events in a non-threatening manner (Weinstein et al., 2009). This adaptive way of coping with stress may need some time until it is manifested in the

individual's life and this could explain why well-being effects are higher at the 4-week follow-up (van de Weijer-Bergsma et al., 2014).

Both accuracy on the SART as well as well-being significantly improved from T1 to T2, which was prior to the start of the MBI. A possible explanation of these findings is that the RNZN JOs had just started their military career and training a few weeks prior the first data collection point. The observed improvements over those four weeks could reflect natural adjustment to military life.

The findings of the present study have implications for new military recruits in training. Considering that many new military recruits often experience high levels of stress (Cigrang et al. 2000), which are likely to impact their performance and well-being, it is imperative to offer interventions that may help to protect against performance and well-being deterioration. The present research shows that a low-dose MBI can help to sustain attentional performance at a high level and even shows a positive impact on well-being at follow-up. Low-dose MBIs may therefore be an element that could be considered part of the training schedule for new military recruits.

This research has a few limitations that need to be considered. Firstly, the sample size is very small, compromising the power of the study. The present study used a non-parametric test to accommodate for this weakness of a small sample which does not meet the assumptions for parametric tests. However, the promising findings should encourage future research investigating the effectiveness of MBIs with larger samples.

Secondly, the improvements in performance and well-being in the pre-intervention period are difficult to interpret and any possible explanations are speculative. Future studies with a similar design should include control measures to capture any other influencing factors that could have had an impact on these variables, such as how study participants were adjusting to military life or their levels of fatigue. Controlling for such variables will help to interpret changes that cannot be attributed to

the intervention. The inclusion of a control group which either receives no MBI or an alternative intervention would be useful to draw causal conclusions regarding the effects of the MBI. For instance, the delayed effect on well-being could be better interpreted in comparison to a control group of the same military cohort. If well-being levels increased for both groups, it would be highly likely that the well-being increase cannot be attributed to the MBI but other factors in their military training environment.

Thirdly, this study did not control for mindfulness home practice. Participants were given a practice log where they were asked to record practice minutes outside formal contact sessions, however, the return rate was so low that this could not be included in the analysis. Encouraging participants to record their practice time and to return it at the end will help to control for the influence of informal home practice.

In summary, this study showed that a low-dose MBI has the potential to protect new RNZN JOs from attentional performance deterioration while attending demanding military training. The MBI also had a positive effects on well-being with enhanced well-being at follow-up. Low-dose MBIs could therefore be considered for inclusion in military training and may be beneficial for performance and well-being outcomes.

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Chapter Five

Effectiveness of a Low-dose Mindfulness-based Intervention on Distress

Paper title and publication status:

Roemer, A., Sutton, A., Grimm, C., & Medvedev, O. N. (2021). Effectiveness of a low-dose mindfulness-based intervention for alleviating distress in young unemployed adults. *Stress and Health*, 37(2), 320-328.

<https://doi.org/10.1002/smi.2997> [Impact factor: 2.34]

Publisher: John Wiley & Sons Ltd.



Received: 22 June 2020 | Revised: 11 October 2020 | Accepted: 14 October 2020

DOI: 10.1002/smi.2997

RESEARCH ARTICLE

WILEY

Effectiveness of a low-dose mindfulness-based intervention for alleviating distress in young unemployed adults

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Funding information

New Zealand Defence Force

Abstract

While the effectiveness of mindfulness-based interventions (MBIs) with respect to distress has been widely researched, unemployed individuals, who often suffer from high levels of distress, have largely been neglected in MBI research. The present study aimed to investigate the effects of a low-dose MBI on distress in a sample of young unemployed adults. The sample included 239 young unemployed adults enrolled for a 6-week long employability-related training camp. Participants were allocated into an intervention group that received weekly 1-hour mindfulness training over 4 weeks, and a control group. Dispositional mindfulness, distress and well-being were assessed in the entire sample prior to the start and upon completion of the mindfulness training. A mixed model ANCOVA showed that distress was inversely and significantly predicted by baseline levels of mindfulness and well-being. After accounting for the baseline levels of mindfulness and well-being, a significant effect of the mindfulness intervention was evident. This result shows that a low-dose MBI can decrease distress in a sample of young unemployed adults and its effectiveness is positively associated with initial levels of dispositional mindfulness and well-being.

KEYWORDS

dispositional mindfulness, mindfulness-based intervention, psychological distress, unemployed, well-being

1 | INTRODUCTION

Unemployment has a negative impact on an individual's financial situation. For this reason, many countries offer unemployment benefits, which often consist of income support (Stovicek & Turrini, 2012). While the negative financial impact is obvious, it should also be acknowledged that unemployment negatively impacts mental health as well. As part of job-seeker support programmes to assist with job re-entry, unemployed people are sometimes offered vocational and psychological training. Such workshops and interventions only provide limited evidence for a reduction of psychological distress (Audhoe, Hoving, Sluiter, & Frings-Dresen, 2010; Koopman, Pieterse, Bohlmeijer, & Drossaert, 2017). The search for

psychological interventions for the unemployed that effectively alleviate distress is therefore warranted, especially during times of recession and economic downturn.

The COVID-19 pandemic has led to increased unemployment in many countries in 2020 and the youth, who were already a vulnerable group prior to the pandemic, have been particularly negatively affected (Blustein et al., 2020). Those who were already unemployed might find it even more difficult to get into employment during these uncertain times. A newly published research agenda by Blustein et al. (2020) addresses the problems associated with unemployment caused by the pandemic and suggests that research focus on interventions to help with the immediate as well as long-term consequences of unemployment.

Unemployment not only has a negative financial impact on an individual's life, but is also associated with severe psychological consequences which can exceed the consequences that are related to pecuniary losses (Clark & Lepinteur, 2019). For example, early adult unemployment compromises an individual's health and well-being (Bell & Blanchflower, 2011; Clark & Lepinteur, 2019; Krasteva, 2018) and such negative effects often persist during a later employment (Clark, Georgellis, & Sanfey, 2001).

A substantial number of studies have addressed the psychological problems related to unemployment and were summarised in a large meta-analysis (Paul & Moser, 2009). Across 323 independent samples and 458,820 participants, it was found that unemployment had a significant negative effect on mental health, indicated through symptoms of distress, depression, anxiety, psychosomatic symptoms and subjective well-being. Furthermore, a systematic review and meta-analysis uncovered that unemployment is also associated with a higher risk of mortality, especially for individuals at early career stages (Roelfs, Shor, Davidson, & Schwartz, 2011). Not only do negative psychological outcomes such as anxiety, worry and depression increase, but positive psychological states, such as positive affect, life satisfaction and self-satisfaction, decrease when experiencing unemployment (Hanisch, 1999). When compared to employed individuals, unemployed people experience significantly more psychological distress (Backhans & Hemmingsson, 2012; Reneflot & Evensen, 2014), which in turn makes it more difficult to find work: unemployed people with higher levels of distress are less likely to get into employment (Schaufeli & VanYperen, 1992). In addition, psychological distress is a predictor of other serious psychological disorders (Kessler et al., 2002). It is therefore crucial to target the issue of high distress and low well-being experienced by the unemployed.

Psychological distress is defined as 'the unique discomforting, emotional state experienced by an individual in response to a specific stressor or demand that may cause harm, either temporary or permanent, to the person' (Ridner, 2004, p. 539). Unemployed people face a variety of situation-specific stressors and demands, such as financial hardship and difficulties finding work, but also social problems, which may result in the experience of a negative emotional state that is a characteristic of psychological distress. To better cope with the challenges the unemployed face, it is necessary that individuals learn to manage their emotional, cognitive and behavioural response to the stressors and demands they have to deal with. Recent research indicates that mindfulness is a promising skill that may help to regulate one's response to stressors and demands in order to manage distress and enhance well-being (Krägeloh et al., 2019).

Mindfulness is defined as the conscious attention to and awareness of the present moment while being non-judgemental and accepting (Kabat-Zinn, 2003). Being mindful involves to attend to internal and external stimuli without judging them (Good et al., 2016). This is a central mechanism underlying mindfulness, which is referred to as decentering. Decentering involves the observation of

stimuli and resulting reactions without interpreting them in either a positive or negative way (Good et al., 2016; Shapiro, Carlson, Astin, & Freedman, 2006). The practice of mindfulness enables one to be observational of one's feelings, thoughts and experiences, which facilitates superior self-regulation, allowing one to respond to a situation in an appropriate manner and not as a result of automaticity or impulsivity. Better self-regulation of feelings, thoughts and behaviour through mindfulness may contribute to lower levels of distress and higher levels of well-being (Brown & Ryan, 2003; Shapiro et al., 2006). This implies that it is beneficial to develop and enhance the skill of mindfulness to manage distress.

Research analysing the impact of mindfulness-based interventions (MBIs), where participants learn how to practice mindfulness, on mental health has gained popularity over the last couple of years, but various MBIs differ in terms of duration and frequency of mindfulness practice (Krägeloh et al., 2019). Traditional MBI protocols suggest 2.5 h of a contact session once a week combined with 45 min of home practice on 6 days a week over a period of 8 weeks (Jamieson & Tuckey, 2017). This protocol has shown to be effective, but it is highly time consuming and might not be practical when conducted with non-clinical samples, who would have to implement it into a daily routine that also entails other responsibilities. Therefore, this time-consuming protocol may be a barrier to adoption. While some studies found even shorter (low-dose) MBIs effective with regards to stress reduction and mental health outcomes (Phang, Mukhtar, Ibrahim, Keng, & Sidik, 2015; Shearer, Hunt, Chowdhury, & Nicol, 2016), other studies analysing the impact of shorter MBIs did not find effects on psychological variables such as life satisfaction, negative affect or stress (Chin, Slutsky, Raye, & Creswell, 2019; Howells, Ivtzan, & Eiroa-Orosa, 2016). However, scientists are investigating the extent to which MBIs can be amended without compromising the beneficial effects, aiming to determine a 'minimum effective dose'.

One review examined whether the length of contact sessions as well as the overall intervention length affected the impact of the MBI on psychological distress (Carmody & Baer, 2009). This review examined studies where the total number of weekly contact sessions ranged from 4 to 10 and duration of those sessions ranged from 1 to 2.5 h. The total in-class hours of all studies ranged from 6 to 28. Taking the pre- and post-test assessments of psychological distress into account, no significant relationship between the number of in-class hours of an MBI and pre- and post-test effect sizes was found. This is an interesting finding, considering that the number and length of weekly contact sessions varied to a great extent between those studies (Carmody & Baer, 2009). Demarzo et al. (2017) provide further evidence that an abbreviated MBI might be as effective as a standard length MBI. Participants in a non-clinical sample were either assigned to a 4- or 8-week MBI group. The intervention in both groups consisted of a 120 min contact session and 45 min of daily home practice. Both interventions produced similar improvements with regards to mindfulness, positive affect, depression and anxiety in comparison to a control group who did not undergo an

intervention. Moreover, a meta-analysis investigated the effects of MBIs on psychological distress with a sample of employed adults and showed that MBIs had a positive effect on psychological distress regardless of intervention length (Virgili, 2015). These findings indicate that abbreviated MBIs may work as well as standard length MBIs, which might be valuable when aiming to conduct MBIs with samples that are suffering from time constraints.

Very little mindfulness research has targeted unemployed individuals so far, though initial findings indicate that an MBI may be beneficial in terms of stress reduction for the unemployed (Creswell et al., 2016; de Jong, Hommes, Brouwers, & Tomic, 2013). Creswell et al. (2016) conducted a study investigating the effects of an MBI versus relaxation training on inflammation markers that are linked to stress among unemployed. Thirty-five participants who had moderate to high scores on a self-report stress measure were either assigned to a 3-day mindfulness meditation training or a 3-day relaxation retreat intervention. Participants in the MBI group showed reductions in stress-related inflammation markers from baseline to follow-up, whereas the relaxation group showed increases of inflammation markers from baseline to follow-up. Positive effects of a mindfulness intervention were also found in a study with 43 unemployed participants. The intervention followed a standardised protocol with a weekly 2.5 h contact session and 45 min of home practice on 6 days a week over a period of 8 weeks. The intervention group showed significant increases in mindfulness and decreases in perceived stress compared to the control group (de Jong et al., 2013). These studies indicate that an MBI may be an appropriate way to reduce distress in individuals who deal with the challenges of unemployment. However, a major criticism of these two studies is the small sample size.

Another largely unaddressed question in MBI research is for which individuals interventions are most effective. It is crucial to identify such moderating personal variables in order to explain why MBIs sometimes do not show positive effects. One of these moderating variables is a person's baseline (pre-treatment) level of mindfulness (Shapiro, Brown, Thoresen, & Plante, 2011): individuals with higher levels of dispositional mindfulness at baseline showed larger increases in mindfulness and well-being and greater decreases in levels of perceived stress. Participants in an MBI with higher levels of mindfulness prior to the intervention may find it easier to engage with and be open to the content of the training and to implement the exercises. For this reason, it is important to consider trait mindfulness prior the intervention as a potential moderator in the process in order to evaluate the success of an MBI.

Previous research has shown that abbreviated, low-dose MBIs may show similar positive effects as standard length MBIs and that MBIs may reduce distress for the unemployed. The aim of the present study is to examine the effects of a low-dose MBI on psychological distress with a sample of young unemployed adults. It is expected that a low-dose mindfulness intervention will be effective for reducing psychological distress and this effect will be moderated by pre-intervention levels of dispositional mindfulness.

2 | METHOD

2.1 | Participants

The participants were 239 members of the Youth Development Unit (YDU), a development programme offered by the New Zealand Defence Force (NZDF) on behalf of the Ministry of Social Development. The YDU aims to help New Zealand youth develop skills needed to enter the workforce. The intervention was conducted within the frame of a training camp facilitated by the NZDF. The 239 participants' age ranged from 17 to 25 years and mean age of the participants was 19.91 years ($SD = 2.04$) and there were almost double as many male (64.4%) than female (35.6%) participants. In terms of ethnicity, the sample consisted of Māori (32.6%), Joint Ethnicity (e.g., NZ European/Māori; 31.4%), NZ European (23.8%), Pasifika (8.8%) and Others (3.3%).

2.2 | Procedure

Ethical approval was granted by the authors' institutional ethics boards and the study was conducted under supervision of registered psychologists. Participation in the training sessions was mandatory for the YDU participants, however, participation in the research element of the training was voluntary and data collection was anonymous. Informed consent was obtained prior to data collection. Pre- and post-intervention data were collected by using unique codes to ensure the participants' anonymity. Participants did not receive any form of compensation.

2.2.1 | Design

The YDU programme was conducted over a period of 6 weeks. The programme is a mix of activities to build self-confidence, teamwork and life skills. Participants engage in classroom learning, skills workshops, military-style team-building activities (e.g., marching and drill), physical exercise as well as outdoor exercises. The programme was delivered at three different locations across the country. A flow diagram with participants' allocation in the program and control groups is displayed in Figure 1. The sample ($n = 239$) was split up into an intervention and a control group. Participants at one location ($n = 115$) received in addition to the normal YDU course content mindfulness training once a week for one hour at the start of the second week for a period of 4 weeks. The remaining participants ($n = 124$) were allocated to the other two training locations. Measures were administered to participants in the control group as well as the intervention group at the start of week 2 and at the end of week 5. Measures were administered by support staff. The measures at the end of week 5 were completed by 86 participants in the intervention group and by 94 participants in the control group. This means 29 participants were lost to follow-up in

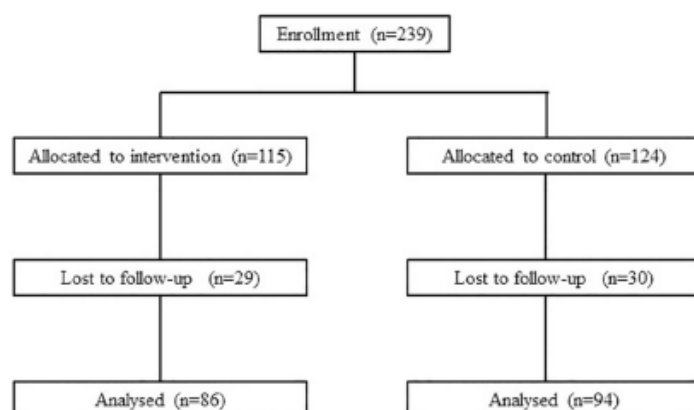


FIGURE 1 CONSORT diagram outlining participants' allocation to groups and dropouts

the intervention group and 30 participants were lost to follow-up in the control group, representing a dropout rate of 25.21% and 24.19%, respectively. The participants who were lost to follow-up did not differ from those who completed the study with regards to gender ($\chi^2 (1,239) = 0.00, p = 0.996$), ethnicity ($\chi^2 (4,239) = 3.29, p = 0.511$), baseline well-being ($F (1,235) = 2.53, p = 0.113$), mindfulness ($F (1,237) = 0.20, p = 0.656$) or distress ($F (1,236) = 0.86, p = 0.355$), and there was no difference in dropout numbers between the intervention and the control groups ($\chi^2 (1,239) = 0.03, p = 0.854$). After considering that non-responders were not different from responders in any way, it was decided to keep only participants who completed both the T1 and T2 measure for evaluation of the intervention.

2.2.2 | Intervention content

The intervention followed an established intervention programme conducted by an organisation that specialises in delivering mindfulness training.

It consisted of a weekly contact session of 1 h over a period of 4 weeks, facilitated by a qualified mindfulness instructor. In addition, participants were encouraged to practice mindfulness in their daily lives, such as brushing teeth mindfully or eating mindfully, and to use a mindfulness app for 10–15 min before their lunch break. However, daily practice compliance was not monitored.

In their first contact session, participants were introduced to mindfulness and its immediate effects. The second contact session was themed around thinking and mindfulness and the third contact session focused on emotions and the interplay with thinking. In week 4, participants learned about the principle of radical acceptance. In order to support and foster learning, participants were given an info booklet after the first week. A typical contact session used a mix of audio and visual material to introduce participants to each topic. After that, participants engaged in mindfulness-based exercises, such as body scans, breathing, identifying internal and external sensations as well as judgements when they arise. Participants also had time for

feedback and reflection. An outline of the intervention with example exercises can be found in the Table S1.

The assigned instructor originates from an Eastern culture with a Buddhist way of life, but spent most years of adult life in New Zealand. The instructor has been facilitating mindfulness training for the organisation for 4 years.

2.3 | Measures

Self-report measures were used to collect demographic data and assess well-being, psychological distress and mindfulness pre- and post-intervention.

2.3.1 | Psychological distress

The Kessler 10 Psychological Distress Scale (K10; Kessler et al., 2002) was used to measure distress, assessing 10 symptoms that are typical for depression and anxiety. Items can be rated on a 5-point Likert scale (1 = none of the time and 5 = all of the time). All items are summed to get an overall score with high scores indicating high levels of psychological distress. The K10 exhibited excellent reliability in the present study ($\alpha T1 = 0.88; \alpha T2 = 0.90$).

2.3.2 | Mindfulness

A shortened version of the Five Facet Mindfulness Questionnaire was used to assess dispositional mindfulness (FFMQ-SF; Bohlmeijer, ten Klooster, Fledderus, Veehof, & Baer, 2011). The instrument consists of 24 items capturing the five dimensions observe, describe, actaware, nonjudge and nonreact, which can be rated on a 5-point Likert scale (1 = never or very rarely true and 5 = very often or always true). Items are summed to get an overall scale score and higher scores indicate higher levels of mindfulness. The measure exhibited good reliability in the present study ($\alpha T1 = 0.78; \alpha T2 = 0.79$).

2.3.3 | Well-being

The short Warwick-Edinburgh Mental Well-being Scale (SWEMWBS; Stewart-Brown et al., 2009) was used to measure well-being. The SWEMWBS is a unidimensional measure consisting of seven items that are rated on a 5-point Likert scale (1 = none of the time and 5 = all of the time). Item scores are summed to yield a scale score. Higher scores indicate higher levels of well-being. As recommended by the test developers, total scores were converted to metric scores with a conversion table (Stewart-Brown et al., 2009). The SWEMWBS was found to be reliable in the present study (α T1 = 0.80; α T2 = 0.85).

2.4 | Data analysis

Data analysis was conducted using IBM SPSS v.25. The dataset was screened for missing values, which were less than 1%. Included in this percentage are two participants who did not complete the well-being measure and one participant who did not complete the measure of psychological distress at T1 and three participants who did not complete the well-being measure and one participant who did not complete the distress measure at T2. These are treated as system-missing values in SPSS. Some participants rated single items with half scores (e.g., 3.5). Those item scores (only 0.3% of all responses) were replaced with rounded mean scores of the respective subscale (Huisman, 2000). All variables displayed acceptable normality of distribution and skewness and kurtosis values were within the conservative recommended range of $-/+ 1$ (Muthén & Kaplan, 1985).

Pearson correlation coefficients were computed to establish relationships between constructs at baseline and post-intervention. A mixed model ANCOVA was used to investigate effects of the mindfulness intervention (IV) on distress (DV), with group (intervention vs. control) as between-subjects and time (pre- and post-intervention) as within-subjects factors while controlling for baseline levels of mindfulness and well-being as covariates.

3 | RESULTS

Demographic statistics are summarised in Table 1. There were no significant differences between groups in distribution of age, sex and ethnicity at baseline. Distress, mindfulness and well-being mean scores did not differ significantly between intervention and control groups at the baseline (all $p > 0.05$). Correlations between study variables presented in Table 2 were examined to identify and confirm potential covariates for a subsequent ANCOVA. Well-being for the entire sample at baseline correlated negatively with distress at T1 ($r = -0.45$) and T2 ($r = -0.27$). The noticeable difference in magnitude of these correlations indicates that baseline level of well-being may influence the outcome of the intervention and needs to be accounted for in an ANCOVA. Similar correlation patterns were observed between mindfulness at T1 and distress at both T1 and T2,

supporting the inclusion of mindfulness at baseline as another covariate in a single omnibus F-test to minimise type I error.

A mixed model ANCOVA showed that psychological distress was inversely and significantly predicted by both covariates: mindfulness ($F(1, 172) = 28.75, p < 0.001, \eta_p^2 = 0.14$) and well-being ($F(1, 172) = 7.04, p = 0.009, \eta_p^2 = 0.04$). After accounting for the effect of covariates, there was a significant effect of time ($F(1, 172) = 15.17, p < 0.001, \eta_p^2 = 0.08$) and a significant interaction between group and time ($F(1, 172) = 4.06, p = 0.045, \eta_p^2 = 0.02$). This shows there is an overall distress reduction observed in both groups as well as a significant effect of the mindfulness intervention. Figure 2 shows that, after accounting for the effects of both covariates, estimated distress mean scores are higher in the intervention group at baseline (Time 1) and lower after the intervention (Time 2) compared to the control group. While distress is reduced in both groups at Time 2, a stronger reduction is observed in the intervention group.

Subsequent post hoc tests showed that scores of well-being $t(175) = -9.23, p < 0.001, d = 0.70$, distress $t(177) = 8.16, p < 0.001, d = 0.61$ and mindfulness $t(179) = -5.36, p < 0.001, d = 0.40$ improved for the sample as a whole from baseline to post-intervention.

4 | DISCUSSION

The COVID-19 pandemic in the year 2020 required a rapid response to the situation of the unemployed and research regarding interventions that may assist with the negative consequences associated with unemployment was warranted (Blustein et al., 2020). The present study investigated the effects of a low-dose MBI on psychological distress in a sample of young unemployed adults within the frame of an employability-related training camp. The results show that psychological distress was inversely and significantly predicted by baseline levels of mindfulness and well-being. After accounting for the effects of these covariates, the short mindfulness intervention was effective in reducing psychological distress. These findings indicate that a low-dose MBI may be more effective for a sample population with initially higher levels of mindfulness perhaps because dispositional mindfulness may enhance openness and acceptance to the intervention.

This study has several implications concerning actions to improve the mental state of unemployed people as well as the benefits of low-dose MBIs. First, the study has shown that an employability-related training course teaching soft and life skills may significantly enhance well-being and reduce psychological distress for the unemployed. Lower levels of psychological distress make it more likely to get into employment (Schaufeli & VanYperen, 1992), which is not only beneficial to the individual, but also to the wider economy.

Second, these results show that a low-dose mindfulness intervention can be an effective way of reducing psychological distress in unemployed individuals, who are a group of people prone to suffer from poor mental health (Backhans & Hemmingsson, 2012).

TABLE 1 Demographic data of the current sample who participated in the camps

Demographics	Total n = 180	Control n = 94	Intervention n = 86	Test of Difference
Mean age (SD)	20.03 (2.07)	20.13 (2.12)	19.93 (2.03)	t-test: $p = 0.52$
Sex n (%)				
Male	116 (64.4)	56 (59.6)	60 (69.8)	χ^2 : $p = 0.15$
Female	64 (35.6)	38 (40.4)	26 (30.2)	-
Ethnicity n (%)				
NZ European	42 (23.3)	22 (23.4)	20 (23.3)	χ^2 : $p = 0.99$
Māori	57 (31.7)	29 (30.9)	28 (32.6)	-
Joint ethnicity	56 (31.1)	31 (33.0)	25 (29.1)	-
Pasifika	17 (9.4)	8 (8.5)	9 (10.5)	-
Other	8 (4.4)	4 (4.2)	4 (4.5)	-

Note: t-test (independent sample t-test); χ^2 (chi square test).

TABLE 2 Correlations between well-being, distress, and mindfulness at T1 and T2 (n = 180)

	1	2	3	4	5	6
1. Well-being T1	(0.80)	-	-	-	-	-
2. Distress T1	-0.45**	(0.88)	-	-	-	-
3. Mindfulness T1	0.53**	-0.51**	(0.78)	-	-	-
4. Well-being T2	0.46**	-0.16*	0.23**	(0.85)	-	-
5. Distress T2	-0.27**	0.54**	-0.40**	-0.46**	(0.90)	-
6. Mindfulness T2	0.46**	-0.38**	0.58**	0.48**	-0.52**	(0.79)

Note: Cronbach's alphas are presented in parentheses.

** $p < 0.01$; * $p < 0.05$.

These findings align with previous research that aimed at improving health of unemployed individuals through an MBI (Creswell et al., 2016; de Jong et al., 2013). Earlier research discussed the necessary dose of MBIs to achieve positive effects on distress (Carmody & Baer, 2009). While some studies did not find significant effects of low-dose MBIs that differed from the standardised protocol of 2.5 h a week for 8 weeks (Chin et al., 2019; Howells et al., 2016), other studies found them to be as effective (Demarzo et al., 2017; Virgili, 2015). The reasons for these inconclusive findings remain unknown, however, one potential factor could be the level of dispositional mindfulness of participants prior the MBI.

Previous research indicated that levels of dispositional mindfulness may have a moderating role with respect to positive effects of an MBI on mindfulness, well-being and distress (Shapiro et al., 2011). The present study's findings indicate that participants with higher baseline levels of mindfulness benefitted more from the mindfulness intervention and experienced stronger decreases in psychological distress. There are several possible mechanisms for this effect. First, as mindfulness itself is defined as a heightened state of awareness resulting from purposefully paying attention to the present moment in a non-judgemental way (Kabat-Zinn, 2003), participants in the intervention group high in dispositional mindfulness might have found it easier to practice what they have learned while on the

mindfulness training (Shapiro et al., 2011). Second, dispositional mindfulness is positively associated with cognitive abilities, such as attentional functions and working memory (Moore & Malinowski, 2009; Ruocco & Wonders, 2013). It is therefore possible that participants with higher levels of mindfulness were better able to pay attention to the intervention content and process it more efficiently. Third, dispositional mindfulness is related to reduced motivated perception, which is a top-down process that influences perceptions through existing desires or expectations (Adair & Fredrickson, 2015). Consequently, more mindful participants might have been less judgemental and biased regarding the intervention they were assigned to, which might have contributed to more openness and engagement with the intervention content and they reaped more benefits as a consequence. These findings imply that it may be useful to assess dispositional mindfulness of participants before the start of an MBI. Depending on the participants' levels of mindfulness, it needs to be considered whether a low-dose MBI is appropriate.

The present study also showed that individuals with higher levels of well-being at baseline similarly benefitted more from the intervention with regards to levels of distress. This finding indicates that a low-dose mindfulness intervention may work better for individuals whose well-being is not severely compromised. Previous research suggests that short MBIs with non-clinical samples may work as well

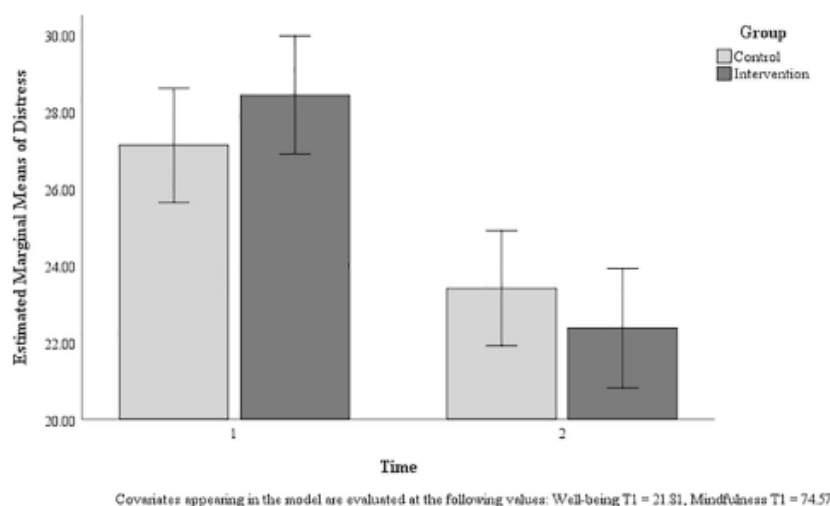


FIGURE 2 Distress mean scores of intervention and control groups at time 1 (pre-) and time 2 (post-intervention) after accounting for effects of mindfulness and well-being covariates at the baseline. Error bars indicating 95% CI

as long MBIs with clinical samples (Virgili, 2015). Individuals with low well-being and/or mindfulness may therefore possibly benefit more from higher-dose or longer mindfulness interventions (Krägeloh et al., 2019).

5 | LIMITATIONS AND FUTURE RESEARCH

This study has a few limitations that need to be acknowledged. First, it used a highly homogenous sample in terms of age and current living situation (unemployment), which does not allow a generalisation of findings. Second, even though participants in the intervention group were encouraged to use an app to practice mindfulness by themselves, compliance was not monitored. It is possible that the more mindful intervention participants tended to practice mindfulness more often outside the face-to-face training, but because this variable has not been assessed, the impact of self-directed practice remains unclear. Third, even though mindfulness as a predisposition at baseline was taken as a moderating variable into account, it is possible that other traits or factors concerning personality had an impact on the effect of the intervention. Fourth, the assignment of participants to the different camp locations was based on the location of their hometown, for this reason the assignment of participants to control and intervention group was not completely random, although analyses indicated no significant differences on study variables between groups at baseline. Lastly, the camp staff who facilitated the camp activities differed between the camps. Apart from the mindfulness training, the camp activities were the same across all camps and all camp staff received standardised training, but it remains possible that camp location and social relationships with staff had an influence on the reported effects.

Future research could further investigate the effects of MBIs on well-being and distress of unemployed individuals, but might want to consider to recruit participants of all age groups to make findings more generalizable. Moreover, it is crucial to monitor and capture practice time outside the training to establish any positive effects from more practice time. In addition to that, future research should address the question of which individuals benefit from MBIs, especially when they are low-dose MBIs that significantly deviate from standardised protocols. It is possible that traits other than dispositional mindfulness may play a moderating role regarding the effects of MBIs. More insight into such factors will allow to make sure that interventions match the participants' skills and cognitive capacities. Furthermore, future research should investigate whether a longer MBI might be more effective for those individuals that have low baseline levels of dispositional mindfulness and well-being.

6 | CONCLUSION

This study found that a low-dose MBI can enhance mindfulness and decrease psychological distress in a sample of young unemployed adults. However, findings indicate that a low-dose MBI seems to be more beneficial to participants that exhibit high levels of dispositional mindfulness and/or well-being prior the intervention. This has important implications regarding the appropriateness of low-dose MBIs in future research and therapy.

ACKNOWLEDGEMENTS

This study is a part of the doctoral work of the first author. The study was funded by the New Zealand Defence Force. We would also like

to thank Wimal Wickramasuriya for his assistance and support in conducting this research.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

AUTHOR CONTRIBUTIONS

Anja Roemer conducted the data analyses and wrote the manuscript. Anna Sutton collaborated with writing and editing of the manuscript. Carsten Grimm collaborated with the design, the data collection and edited the manuscript. Oleg N. Medvedev collaborated with data analysis, writing and editing the manuscript. All authors approved the final version of the manuscript for submission.

DATA AVAILABILITY STATEMENT

The current dataset cannot be made publicly available due to confidentiality.

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SUPPORTING INFORMATION

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How to cite this article: Roemer A, Sutton A, Grimm C, Medvedev ON. Effectiveness of a low-dose mindfulness-based intervention for alleviating distress in young unemployed adults. *Stress and Health*. 2021;37:320–328. <https://doi.org/10.1002/smi.2997>

Chapter Six

Differential Contribution of Mindfulness Facets

Paper title and publication status:

Roemer, A., Sutton, A., Grimm, C., & Medvedev, O. N. (2021). Differential contribution of the five facets of mindfulness to well-being and psychological distress. *Mindfulness*, 12, 693-700. <https://doi.org/10.1007/s12671-020-01535-y>
[Impact factor: 3.58]

Publisher: Springer Science+Business Media, LLC, part of Springer Nature



Differential Contribution of the Five Facets of Mindfulness to Well-being and Psychological Distress

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Accepted: 21 October 2020 / Published online: 5 November 2020
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Abstract

Objectives Mindfulness has been shown to have beneficial effects with regard to improving well-being and lowering levels of distress. The Five Facet Mindfulness Questionnaire (FFMQ) has identified facets reflecting distinct mindfulness capacities, but it is not known yet to what extent they contribute individually to important outcomes such as well-being and distress. This study aimed to identify the most relevant facets and their unique contributions to distress and well-being to potentially enhance mindfulness-based interventions targeting these outcomes.

Methods The present study assessed dispositional mindfulness, well-being and psychological distress in a sample of young adults ($n = 239$) and analyzed the differential contributions of mindfulness facets to distress and well-being outcome variables using stepwise multiple linear regression analyses.

Results Individual differences in well-being and distress levels were best explained by different facets of mindfulness. The Nonreacting facet was the strongest contributor to well-being explaining 25% of variance in well-being scores, and after accounting for its contribution, Describing was the second largest contributor explaining additional 9%. In contrast, Acting with awareness was the strongest inverse contributor to distress explaining 20% variance and after controlling for it, Nonreacting explained merely 7% of additional differences in distress scores. After accounting for these main contributors, other facets explained only negligible amount of variance or were non-significant contributors.

Conclusions The present study indicates that different capacities contribute differentially to well-being and distress. These findings may be useful for enhancing effectiveness of mindfulness-based interventions by tailoring practices to target well-being or psychological distress.

Keywords Dispositional mindfulness · Five Facet Mindfulness Questionnaire · Well-being · Psychological distress · Psychological health

Research over the last couple of years has shown that mindfulness has a positive effect on mental health outcomes such as well-being and distress (Hwang et al. 2019; Krägeloh et al. 2019; Strohmaier et al. 2020). Mindfulness involves the attention to and awareness of experiences in the present moment as well as being observational and nonjudgmental of arising internal and external stimuli (Kabat-Zinn 2003). The heightened state of awareness and attention in concert

with an observational and nonjudgmental stance enables one to experience stimuli and internal processes just as what they are without automatically attaching any conceptual meaning to them (Good et al. 2016). Mindfulness is an inherent human capacity, which all individuals possess to a different degree and this capacity can be enhanced (Brown and Ryan 2003; Kabat-Zinn 2003). A growing number of studies provide support for the effectiveness of mindfulness with respect to improved levels of well-being and alleviating burnout and distress (Grégoire and Lachance 2015; Huang et al. 2015; Hwang et al. 2019; Spijkerman et al. 2016). Even though the research interest in mindfulness and its effects on well-being and distress is high, it remains unclear how exactly the various capacities that mindfulness practice aims to enhance contribute to those mental health outcomes.

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Mindfulness is typically assessed with self-report questionnaires, and assessment scores can be used to predict outcome variables such as psychological distress (Krägeloh et al. 2019; Medvedev et al. 2018a) and well-being (Malinowski and Lim 2015). Moreover, mindfulness self-report measures allow the detection of changes in levels of mindfulness after interventions or in longitudinal studies (Aikens et al. 2014; Gu et al. 2015). One of the most widely used dispositional mindfulness measures is the Five Facet Mindfulness Questionnaire (FFMQ) (Baer et al. 2006), which has been cited nearly 6000 times on Google Scholar to date. The FFMQ consists of 39 items representing five facets. Those five facets form the five subscales of the FFMQ and represent capacities that are usually targeted and enhanced in the context of mindfulness-based interventions and therapy, such as developing awareness, being observational and descriptive of experiences in the present moment, and being nonjudgmental and nonreactive towards stimuli and experiences (Baer et al. 2004, 2006). The advantage of a multi-faceted mindfulness measure is that researchers can investigate how various mindfulness capacities differentially relate to health outcomes. This way of measuring mindfulness also helps therapists to identify what capacities need to be strengthened to support mindfulness development (Baer et al. 2004).

The Observing subscale measures an individual's ability to be observational of internal and external stimuli. The subscale Describing measures how well an individual is able to verbally express their experiences. The Nonreacting subscale assesses to what extent one is aware of internal stimuli such as feelings and thoughts without reacting to them. The subscale Nonjudging measures to what degree an individual is capable of accepting and tolerating unpleasant thoughts and feelings without being judgmental about them. Finally, the subscale Acting with awareness captures one's ability to be fully aware and attentive of the present activities one engaged in (Baer et al. 2004, 2006). The FFMQ was found to be valid and reliable, but Baer et al. (2006) note that previous meditation experience may have an impact on the factor structure; for instance, it was shown that the subscale Observing in the five-factor structure model showed a better fit with a sample that had previous meditation experience. Moreover, it was reported that the Observing subscale only significantly predicts positive psychological adjustment for individuals with meditation experience, but not for individuals who have not meditated before (Baer et al. 2008).

While mindfulness conceptualized through the five facets of the FFMQ seems to be generally beneficial concerning well-being and distress, some studies investigated whether the five facets of mindfulness serve different functions when it comes to enhancing well-being and reducing distress. Studies focused on the facets' relationship with measures of well-being found that more often Describing and Nonjudging were positively associated with higher levels of well-being

(Bergin and Pakenham 2016; Bowlin and Baer 2012; Soysa and Wilcomb 2015). The facets Nonjudging, Nonreacting, and Acting with awareness in contrast were more often related to lower levels of distress, anxiety, depression, and stress (Bergin and Pakenham 2016; Bowlin and Baer 2012; Cash and Whittingham 2010; Hawley et al. 2017; Medvedev et al. 2018a; Short et al. 2016; Slonim et al. 2015; Soysa and Wilcomb 2015). A few studies also reported a positive impact of the facet Describing on distress (Bergin and Pakenham 2016; Short et al. 2016). These studies indicate that mindfulness improves well-being and alleviates distress in different ways: some of the facets seem to predict well-being, while others uniquely contribute to lower levels of distress. However, these studies have several methodological limitations that need to be addressed in future research.

For instance, studies with smaller sample sizes (e.g., $n < 100$) and many predictor variables might have led to a bias or underestimation of effects as small samples are vulnerable to type II error. Consequently, an adequate sample size is needed when multiple predictor variables are taken into account. Studies that included adequate sample sizes were limited to student populations (Bergin and Pakenham 2016; Bowlin and Baer 2012; Slonim et al. 2015; Soysa and Wilcomb 2015) or clinical populations (Hawley et al. 2017), which limits generalizability of their findings and is another limitation. There is evidence of differences between students and the general population concerning specific contributions of mindfulness facets to psychological distress variables (Medvedev et al. 2018a). In addition, there is lack of studies that investigated unique contributions of mindfulness facets to well-being and distress simultaneously using the same sample (Tomlinson et al. 2018). A simultaneous assessment of these essential outcomes is the only way to examine the differential contribution of mindfulness facets.

A major limitation of almost all studies is that their analytical approaches do not allow ranking of the individual facets according to their importance, as some might explain more variance in outcomes than others. Most studies used regressions where all facets were entered in one step, which may be potentially misleading as facets share common mindfulness variance. Several studies for instance found that both the Nonjudging as well as the Acting with awareness facet inversely predicted depression (Bergin and Pakenham 2016; Cash and Whittingham 2010; Soysa and Wilcomb 2015). However, no conclusions can be drawn with respect to the individual importance of each facet.

In order to explore the unique contribution of various facets to the outcome (e.g., distress), facets can be entered in a step-wise fashion using regression analyses. This method is a combination of the forward and backward entering regression approach, where facets are entered ($p < .05$) or removed ($p > .05$) one after another starting from a facet that explains the largest amount of unique variance in the outcome variable.

Redundant and extraneous facets may suppress valid facets because of shared variance; for this reason, stepwise regression enters facets again that have been removed in a previous step if they gain explanatory power in a later step. As a result, facets are ranked according to importance and problematic facets are identified and removed (Siegling et al. 2018).

While Medvedev et al. (2018a) adopted a stepwise regression approach in order to examine which mindfulness facets most strongly predict dimensions of distress, their study did not examine and compare contributions of mindfulness facets to well-being in the same sample. It therefore still remains unclear to what extent the five mindfulness facets explain variance in well-being and distress. This is important to consider when it comes to using mindfulness in a therapeutic context, as some capacities might have more predictive power than others when it comes to enhancing well-being and alleviating distress.

The assumption that mindfulness facets contribute differently to well-being and distress has the premise that well-being and distress are different and independent constructs. The definition of health suggests that it includes aspects of malaise as well as well-being: Health is “the capability to cope with and to manage one’s own malaise and well-being conditions” (Leonardi 2018, p. 742). In order to achieve a state of health, one has to address both low levels of well-being as well as high levels of distress, which may be enhanced with various mindfulness capacities. The aim of the present study was to investigate the differential contributions of the facets of mindfulness to well-being and psychological distress.

Method

Participants

The data for the present study were collected from 239 young adults with age ranging from 17 to 25 (mean = 19.91 years, SD = 2.04) who were on an employability-related training course. The aim of the training course was to teach participants job and life skills. Subjects did not receive any form of compensation or reward and participation was voluntary. The sample comprised of 154 males (64.4%) and 85 females (35.6%). Ethnic groups included 32.6% Māori, 23.8% NZ European, 31.4% of Joint Ethnicity (e.g., Māori/NZ European), 8.8% Pasifika, and 3.3% others. Forty-three percent of participants reported that they had engaged in mindfulness practice before. An a priori power analysis using G*Power 3.1 was conducted to determine the required sample size for a multiple regression analysis with eight predictors, an effect size of 0.15, α error probability of 0.05, and anticipated power of 0.95, which yielded a required sample size of $n = 160$ for these parameters. The current sample is greater, which contributes to more statistical power.

Procedures

The authors’ institutional ethics committee has granted ethical approval. Prior to the start of the training course, participants were given an information sheet that explained the purpose and procedure of the study, and they signed a consent form agreeing to voluntary and anonymous participation. After obtaining informed consent, the study facilitators administered the questionnaires in paper and pencil format before starting the training course. The assessment consisted of demographic questions and measures of well-being, mindfulness, and psychological distress.

Measures

Dispositional mindfulness was assessed with the shortened, 24-item version of the FFMQ (Bohlmeijer et al. 2011). This FFMQ-SF was shown to be reliable in previous research, exhibiting Cronbach’s alpha coefficients ranging from 0.73 to 0.91 for the respective subscales (Bohlmeijer et al. 2011) and demonstrated acceptable fit to the Rasch model (Medvedev et al. 2018b). The FFMQ-SF consists of the five subscales of Acting with Awareness, Describing, Observing, Nonreacting (to inner experiences), and Nonjudging (to inner experiences). Items are rated on a 5-point Likert scale with response options ranging from 1 = “Never or very rarely true” to 5 = “Very often or always true”. Twelve items are negatively worded and required recoding prior any analysis. Total scores of each subscale were obtained by summing up all items of the respective subscale. The FFMQ-SF was found to be reliable in the present study ($\alpha = 0.78$). The subscales also showed acceptable internal consistency with Cronbach’s alpha coefficients ranging from $\alpha = .60$ to $\alpha = .76$ in the present study.

Well-being was measured using the short version of the Warwick-Edinburgh Mental Well-being Scale (SWEMWBS; Stewart-Brown et al. 2009). The SWEMWBS is a 7-item self-report measure using a 5-point Likert scale with response options ranging from 1 = “None of the time” to 5 = “All of the time.” All items are positively worded and are summed together to get a total score. Higher scores indicate higher levels of well-being. As advised by the test developers, raw scores were converted into metric (interval-level) scores (Stewart-Brown et al. 2009). The SWEMWBS showed to be reliable in the present study ($\alpha = 0.77$).

Psychological distress was assessed with the K10 (Kessler et al. 2002). The K10 is a 10-item scale measuring indicators of depression and anxiety. Items are rated on a 5-point Likert scale ranging from 1 = “None of the time” to 5 = “All of the time.” All items are summed up to yield an overall score with high scores indicating high levels of psychological distress. The K10 was found to be highly reliable ($\alpha = 0.89$) in the present study.

Data Analysis

Data analysis was conducted using IBM SPSS v.25. The dataset was screened for missing values, which were less than 1%. Included in this percentage are two participants who did not complete the well-being measure and one participant who did not complete the measure of psychological distress. These are treated as system-missing values in SPSS. A few participants rated single items with half scores (e.g., 2.5). Those item scores (only 0.4% of all responses) were replaced with rounded mean scores of the respective subscale (Huisman 2000). All variables satisfactorily met the assumption of normal distribution. All skewness and kurtosis values were within the acceptable range of ± 1 (Muthén and Kaplan 1985). Moreover, the assumptions for multiple regression analyses were checked. Multivariate normality was investigated for regression models by checking the normal P-P plot for standardized residuals, and the homoscedasticity assumption was checked with a scatterplot of standardized residuals plotted against standardized predicted values. The assumptions of multivariate normality and homoscedasticity were met. The potential issue of multicollinearity was checked by assessing VIF values, which were all below the critical conservative value of 5 (Garson 2012). Raw scores of the SWEMWBS were transformed into metric scores for all further analyses, as advised by test developers who provided a conversion table (Stewart-Brown et al. 2009).

Pearson correlation coefficients were computed between the total scale and subscale scores of all variables. Stepwise multiple linear regression, which is a combination of forward and backward entry, formed part of the main analysis to determine the contribution of the mindfulness facets to well-being and psychological distress. The strongest predictor that explains most of the variance in the outcome is included first. After controlling for the variance explained by this predictor, other significant predictors that explain unique variance in the outcome are included one after another while constantly reassessing the model in order to remove redundant predictors (Siegling et al. 2018). The statistical criterion for entry of a facet was $p < .05$ and for removal of a facet was $p > .10$. After entering the demographic variables sex and meditation practice first, Acting, Describing, Observing, Nonreacting, and Nonjudging were entered stepwise as predictor variables of well-being. The same procedure was applied to predict psychological distress. Sex and meditation practice were entered first as control variables, followed by the mindfulness facets in a stepwise fashion. Distress and well-being respectively were added as the final predictor variable in both analyses to investigate how much of the remaining variance in the outcome variable is explained by its inverse construct after controlling for mindfulness. If distress and well-being only have little explanatory power after controlling for mindfulness, this indicates that in order to target well-being or distress,

it will be more beneficial to work on mindfulness instead of focusing on the inverse construct of well-being/distress.

Results

Levels of the overall mindfulness, well-being, and distress did not differ significantly between participants with mindfulness experience and participants without mindfulness experience (all $p > .05$). There was no relationship between sex and meditation practice ($\chi^2(1) = 3.65, p = .06$). There were also no differences between participants with mindfulness experience and without mindfulness experience on the Describing, Nonreacting, Nonjudging, and Acting with awareness subscales (all $p > .05$). However, participants who reported that they had engaged in mindfulness practice scored higher ($M = 15.24, SD = 3.15$) on the Observing subscale than participants who had not engaged in mindfulness practice ($M = 13.56, SD = 3.65$), $F(1,237) = 13.96, p < .001, \eta_p^2 = .056$. Males showed significantly higher levels of mindfulness ($M = 75.78, SD = 11.56$) than females ($M = 72.09, SD = 10.46$), $F(1,237) = 5.95, p < .05, \eta_p^2 = .024$. Females on the other hand showed significantly higher levels of distress ($M = 30.33, SD = 8.96$) compared to males ($M = 26.67, SD = 8.49$), $F(1,237) = 9.78, p < .05, \eta_p^2 = .040$.

Pearson correlation coefficients between the variables of interest were computed and are presented in Table 1. Overall mindfulness correlated positively with well-being ($r = .52, p < .01$) and negatively with psychological distress ($r = -.54, p < .01$). The well-being scale showed significant, positive correlations with all mindfulness subscales (ranging from .23 to .51), except of the Nonjudging subscale. The psychological distress scale in contrast, showed negative correlations with all mindfulness subscales (ranging from $-.23$ to $-.47$) except for Observing. Observing showed no correlation with Acting with awareness and also not with distress. Nonjudging had no correlation with Describing and Nonreacting.

Table 2 includes two separate regressions predicting well-being and distress where sex and meditation practice were entered as control variables in the first block and the mindfulness facets were entered stepwise in the second regression block. Nonsignificant predictors (mindfulness facets) were not included. Sex and meditation practice were not significant predictors of well-being, but sex significantly predicted distress accounting for 4% of variance indicating that females experience higher distress levels ($M = 30.33, SD = 8.96$) compared to males ($M = 26.67, SD = 8.49$).

After controlling for demographic variables and entering mindfulness predictors in a stepwise fashion, the Nonreacting facet was the strongest predictor of well-being ($\beta = .50, p < .001$) explaining 25% of individual differences in well-being scores. In contrast, Acting with awareness facet

Table 1 Pearson correlation matrix between the SWEMWBS (well-being) total score, the FFMQ (mindfulness) total score, the K10 (psychological distress) total score, and the FFMQ subscales (Describe, Nonreact, Nonjudge, Observe, and Actaware) for the entire sample ($n = 239$)

Variables	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
1. Well-being	21.56	3.97	(.77)							
2. Mindfulness	74.47	11.30	.52**	(.78)						
3. Distress	27.97	8.82	-.44**	-.54**	(.87)					
4. Describe	15.26	4.20	.48**	.71**	-.39**	(.74)				
5. Nonreact	15.72	4.17	.51**	.69**	-.41**	.40**	(.76)			
6. Nonjudge	13.57	3.75	-.06	.37**	-.23**	.02	-.03	(.60)		
7. Observe	14.29	3.53	.31**	.41**	-.03	.21**	.30**	-.26**	(.69)	
8. Actaware	15.62	3.73	.23**	.69**	-.47**	.38**	.28**	.36**	.00	(.70)

Cronbach's alphas are presented in parentheses

M Mean, *SD* standard deviation** $p < 0.01$

was the strongest inverse predictor ($\beta = -.45, p < .001$) explaining 20% of distress. These results imply that well-being increases by half a SD and distress decreases by almost half a SD when Nonreacting and Acting with awareness increase by one SD.

After controlling for the strongest predictors extracted using the stepwise approach, Describing was extracted as the second significant predictor ($\beta = .34, p < .001$) explaining 9% of well-being and Nonreacting was the second inverse

predictor ($\beta = -.29, p < .001$) of distress accounting for subsequent 7% of variance in scores. After accounting for already extracted predictors, Observing ($\beta = .16, p < .01$) explained additional 2% in well-being and Describing ($\beta = -.16, p < .05$) further 2% in distress. Finally, after controlling for previously extracted predictors, Nonjudging ($\beta = -.13, p < .05$) still accounted for 1% of distress. When all extracted predictors were accounted for, Acting with awareness and Nonjudging were not significant predictors of well-being,

Table 2 Summary of the multiple linear regression analyses predicting well-being and psychological distress using the subscales of the FFMQ and well-being and distress

Outcome	Block and predictors	R^2	R^2 change	Standardized β
Well-being	Control	.01	.01	
	1 Sex			-.12
	2 Practice			-.02
	FFMQ facets			
	3 Nonreact	.26	.25	.50**
	4 Describe	.35	.09	.34**
Distress	5 Observe	.37	.02	.16**
	Inverse construct			
	6 Distress	.42	.05	-.24**
	Control	.04	.04	
	1 Sex			.21**
	2 Practice			.06
	FFMQ facets			
	3 Actaware	.24	.20	-.45**
	4 Nonreact	.31	.07	-.29**
	5 Describe	.33	.02	-.16*
	6 Nonjudge	.34	.01	-.13*
	Inverse construct			
	7 Well-being	.39	.05	-.26**

Two analyses were conducted, predicting the overall SWEMWBS well-being score and the overall K10 distress score

** $p < .01$; * $p < .05$

and Observing did not contribute significantly to low distress levels. In the final block of the regression, after controlling for mindfulness, distress explained ($\beta = -.24, p < .001$) merely 5% of additional variance in well-being, and similarly well-being inversely predicted ($\beta = -.26, p < .001$) 5% of variance in distress.

Discussion

The aim of this study was to investigate the differential contributions of the five facets of mindfulness to well-being and distress. Previous research indicated that different mindfulness facets may explain well-being and distress differentially, which was not yet rigorously investigated using suitable methodology (Tomlinson et al. 2018; Medvedev et al. 2018a). The present study used stepwise regressions with the results supporting the assumption that the five facets of mindfulness contribute differently to well-being and psychological distress.

Individual differences in well-being and distress levels were best explained by different facets of mindfulness. The Nonreacting facet was the strongest contributor to well-being explaining 25% of variance in well-being scores, and after accounting for its contribution, Describing was the second largest contributor explaining additional 9%. In contrast, Acting with awareness was the strongest inverse contributor to distress explaining 20% of variance, and after controlling for it, Nonreacting explained merely 7% of additional differences in distress scores. After accounting for these main contributors, other facets explained only negligible amount of variance or were non-significant contributors.

After Nonreacting and Acting with awareness have been extracted as the strongest predictors for well-being and distress, respectively, all the subsequently extracted predictors only explained small amounts of variance (ranging from 1 to 9%) in the respective outcome variable. This finding highlights the importance of the facets Nonreacting and Acting with awareness with regards to well-being and distress, respectively. If it is aimed to improve levels of well-being, being nonreactive to internal stimuli seems to be of particular value, whereas being aware of the present moment may help to manage feelings of distress.

Data in the present study also revealed that participants with previous meditation experience scored higher on the Observing subscale than participants without meditation experience, confirming previous research (Baer et al. 2006, 2008). However, meditation experience had no impact on overall levels of mindfulness, well-being and distress.

These research findings may be useful for investigating the effects of mindfulness-based interventions that aim to lower distress and enhance well-being. It seems that the five facets of mindfulness serve different functions in altering distress and

well-being, and thus, it is important to train each capacity when targeting mental health comprehensively. The present research findings indicate that it may be beneficial in terms of lowering distress to learn to be fully aware of and attentive to the present moment. Acting with awareness was previously found to be positively associated with self-regulation (Short et al. 2016). If one is fully aware of the present moment and one's actions, it is easier to detect counterproductive thinking patterns or dysfunctional behavior and adjust them accordingly. Moreover, the ability to act with awareness may also enhance one's perception of accessible resources, which may help with coping and prevent distress (Cash and Whittingham 2010).

Previous research also concluded that Nonreacting may be a useful facet with respect to mental health and that it may be interpreted as a way of implementing acceptance (Baer et al. 2006). With regards to well-being, the present study showed it may be beneficial to become aware and accepting of one's internal reactions without immediately responding to them (Nonreacting). Earlier research indicated that Nonreacting was related to feelings of positive affect, which in turn was positively associated with psychological resources such as self-efficacy, optimism, hope, and resilience. These psychological resources were then found to be positively related to well-being (Malinowski and Lim 2015). Nonreacting prevents impulsive reactions to internal stimuli and may enable one to access psychological resources that facilitate successful coping, which may then contribute to higher levels of well-being.

Limitations and Directions of Future Research

A few limitations of the present study need to be acknowledged. Firstly, this study used a cross-sectional research design, which does not allow to causal conclusions to be drawn. Secondly, almost 2 in 3 participants were male. The results may therefore be less generalizable to females. However, this can be seen as an advantage to compensate for overrepresentation of females across student samples in earlier studies (Bowlins and Baer 2012; Soysa and Wilcomb 2015). Thirdly, in this study, the FFMQ was used to assess mindfulness facets. Some authors (Baer et al. 2006, 2008) have suggested that the FFMQ is a more suitable measure of mindfulness for meditators than non-meditators, which could be a potential limitation in a study that included naïve participants. However, we found no differences between meditators and non-meditators in our sample on any of the FFMQ facets except the observing facet, and thus, the FFMQ seems a suitable measure for our study population. Almost half of the participants indicated to have engaged in mindfulness practice before. Even though scoring higher on the Observing subscale, they did not score significantly higher on overall mindfulness and well-being and lower on psychological distress than other participants. It remains unclear how often these participants practiced mindfulness

and whether it aligned with common definitions of mindfulness practice, which generally includes attention training to specific or spontaneously happening events of the individual's experience on a physical and/or mental level (Hwang and Kearney 2013).

Fourthly, common method bias is an additional limitation in the present study. All self-report measures were completed in a single assessment session, which may have contributed to biased results. Participants might have tried to be consistent in their responses across measures, made guesses regarding potential relationships, or given socially desirable responses, which may have resulted in spurious correlations (Podsakoff et al. 2003). Results should therefore be interpreted with caution.

Future research should focus on the predictive value of the five mindfulness facets with a longitudinal study design in order to be able to draw causal conclusions. Interventions with pre- and post-test measures would be beneficial in terms of balancing differences on the Observing scale due to a lack of meditation experience. Furthermore, only short versions of respective measures were used in the present study because problems concerning attention span with that specific sample were expected. Future studies may want to use the full versions of those respective measures. Moreover, future research that aims to identify the most important mindfulness facets to outcome variable should make use of stepwise hierarchical regression analysis. Research regarding the impact of the mindfulness facets on well-being parameters is still scarce. Future studies could address this undoubtedly relevant and important research question by including more parameters of well-being to further validate a positive relationship between single mindfulness facets and various well-being variables. The same applies to the relationship of the different facets with negative health outcomes that add to the findings that apply to distress.

In summary, this study investigated the differential contribution of mindfulness facets to well-being and distress in an adequate sample of young adults using stepwise regression analyses. The majority of earlier studies only used student samples and not samples from the general population. In addition to that, not all studies assessed both well-being and distress. Moreover, most previous studies used analytical approaches that do not permit the identification of the most relevant predictor facets nor allow valid comparisons of the variance they explain in an outcome variable. It was found that different mindfulness facets contribute to well-being and distress differentially, concluding that Nonreacting is the most important contributor to well-being while Acting with awareness the most relevant inverse contributor to distress.

Authors' Contributions AR conducted the data analyses and wrote the manuscript. AS collaborated with writing and editing of the manuscript. CG collaborated with the design and the data collection and edited the

manuscript. OM collaborated with the data analyses, writing, and editing of the manuscript. All authors approved the final version of the manuscript for submission.

Funding This study is part of doctoral work of the first author. The study was funded by the New Zealand Defence Force.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical approval This research was approved by the Ethics Committee of the New Zealand Defence Force.

Informed Consent Statement All participants provided informed consent prior to completing this study.

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Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Chapter Seven

General Discussion

This thesis set out to study mindfulness in various contexts with different samples to investigate its potential benefits across different populations and contexts. While mindfulness has received a lot of attention by researchers and the public media, we do not know much about conditions where it is most beneficial or the extent to which it works for everyone. This thesis aimed to answer these two main questions:

- 1) Does mindfulness help employees to deal with specific challenges at work?
- 2) How can we effectively enhance mindfulness and associated performance and mental health outcomes?

The first question is addressed by investigating whether mindfulness could buffer the negative mental health effects of inauthenticity at work and whether mindfulness could enhance readiness for change in the workplace. The second question is addressed by investigating the effectiveness of low-dose MBIs in two different samples looking at performance and mental health outcomes, as well as identifying how the different facets of mindfulness relate to mental health.

This chapter begins with a summary of the main results and discussion of each of the studies. After that, the theoretical and practical implications of this thesis' findings will be discussed, followed by limitations and directions for future research. The chapter will then end with final conclusions.

Inauthenticity, Readiness for Change and Mindfulness

Authenticity has been identified as an important factor related to employee well-being (Sutton, 2020), however, workplace demands may not always enable employees to be and express their true selves (Sutton, 2018). One aim of this thesis was to investigate whether mindfulness could help employees deal with these feelings of inauthenticity. Study One (Roemer et al., 2021a) found that both authenticity and

mindfulness were negatively correlated with depression and also that mindfulness can buffer the impact of inauthenticity on levels of depression. It is possible that mindful individuals who are aware that they are being inauthentic are able to better deal with it. They might see their inauthenticity as a necessity in their current environment and are nonjudgmental of it. It is possible that they see it just as what it is without interpreting it as either good or bad and thus accept it. A higher level of mindfulness might therefore buffer the negative effect of inauthenticity on mental health. While it is desirable to promote and encourage authenticity in the workplace, it might sometimes not be practical. In such cases becoming more mindful may be helpful for the mental health of employees.

Another challenge that had been identified is organisational change due to the COVID-19 pandemic. Many organisations and businesses were suddenly required to change the way they operated, for instance by implementing social distance requirements and increased use of technology due to remote work (Semple & Cherrie, 2020). Employee readiness for change is an important precursor of successful change (Oreg et al., 2011). It is therefore important to identify how readiness for change can be facilitated. Mindfulness as a predictor of readiness for change is discussed in the literature (Gärtner et al., 2013; Gondo et al., 2013), and Charoensukmongkol (2016) found preliminary empirical evidence that mindfulness is negatively related to negative affective and cognitive reactions during change. Considering that mindfulness is associated with better self-regulation (Brown & Ryan, 2003), this thesis aimed at investigating whether mindfulness may be associated with greater readiness for change.

Results of Study Two (Roemer et al., 2021b) indicate that mindfulness can enhance readiness for change, but only when levels of well-being are high, and levels of distress are low. This suggests that the promotion of mindfulness could help employees to better deal with change at work, however, mindfulness cannot be regarded as a

solution to all problems. The mental health of employees is just as important as mindfulness and organisations may therefore have to address the underlying sources of impaired mental health before endorsing mindfulness to facilitate change. While mindfulness can have benefits at work, it is also important that organisations think about how a culture can be implemented that fosters and encourages mindfulness in an appropriate way without neglecting structural problems that need to be addressed separately (Hülshager, 2015; Hyland, 2015). Fostering an organisational culture that encourages mindfulness could be done by ensuring that employees actually have the time and also the resources to practice mindfulness at work as done by software company SAP for example (SAP, 2021), rather than just assigning them to an intervention. Furthermore, the use of mindfulness should be encouraged, and also modelled by leadership to make it part of the organisational culture.

In conclusion, it was found that mindfulness may be a valuable personal resource in the workplace. Mindfulness can help to cope with inauthenticity in the workplace by buffering its negative impact on depression. Furthermore, mindful employees may deal better with change in the workplace, but this relationship is only significant when their levels of mental health are not compromised.

Mindfulness-based Interventions, Performance and Mental Health Outcomes

Mindfulness is associated with positive outcomes that are relevant in the workplace, as demonstrated in Study One (Roemer et al., 2021a) and Two (Roemer et al., 2021b). It is therefore desirable to enhance mindfulness through MBIs. Standard protocols are time consuming and may be a barrier to adoption for employees who have to include these in their daily lives, which is why there is a high demand for low-dose MBIs (Jamieson & Tuckey, 2017). Meta-analyses did not find significant moderation effects of intervention type and length (Bartlett et al., 2019; Carmody & Baer, 2009; Lomas et al., 2019; Vonderlin et al., 2020), indicating that shorter interventions may be

as effective. However, some low-dose MBIs in the literature did not find effects (Chin et al., 2019; Howells et al., 2016), triggering the question: what might a minimal effective dose be?

Study Three (Roemer et al., in preparation) conducted a low-dose MBI with Navy Junior Officers undergoing demanding military training. Previous research showed intense military training may compromise attentional performance of military personnel and that a low-dose MBI may protect from decline in attentional performance (Jha et al., 2015). Results from Study Three align with these findings and suggest that a low-dose MBI might have protected from attentional performance deterioration while undergoing military training. However, Study Three found that a low-dose MBI may only show well-being effects at a follow-up assessment a few weeks after completion of the intervention. It is possible that some intervention effects might be missed if no follow-up assessment is included, because integration of mindfulness in one's daily life may take some time, as described in previous literature (van de Weijer-Bergsma et al., 2014). Literature also suggests that low-dose MBIs may help to kickstart the integration of mindfulness into one's life, however, in order to achieve sustainable effects, continued mindfulness practice is recommended to make it part of daily life after interventions have ended (Hülshager, 2015).

An additional question that may help to answer why some low-dose MBIs show positive effects, and some do not is: what psychological predispositions may influence the outcome of MBIs (Hyland et al., 2015)? Shapiro et al. (2011) found that an MBI was more beneficial for individuals who had higher levels of mindfulness prior to the start of the intervention. This thesis investigated whether this effect holds for low-dose MBIs. Study Four (Roemer et al., 2021c) analysed the effects of a low-dose MBI on psychological distress in young unemployed adults while accounting for psychological factors at baseline. The sample was split into a control group and an intervention group.

The intervention group received one hour of weekly mindfulness training for four weeks. Results show that compared to the control group, the intervention was effective in reducing levels of distress but only for those who had higher levels of mindfulness and well-being at baseline. These findings shed some light on the question: why do some low-dose MBIs not seem to show effects? While no effect can be observed without controlling for mindfulness and well-being at baseline, an effect is evident when these variables are considered. The body of literature on MBIs in organisational settings often solely investigates whether interventions show effects on outcome variables (Bartlett et al., 2019; Lomas et al., 2019; Vonderlin et al., 2020), but it is very rarely questioned under which conditions and for whom low-dose MBIs work best. Some demographics, such as gender, age and education seem to have an influence on MBI outcomes (Lomas et al., 2019; Vonderlin et al., 2020), but there is little knowledge regarding effects of psychological moderators. Findings from this thesis extend knowledge of the effectiveness of low-dose MBIs by taking into account for whom they actually work.

Studies Three (Roemer et al., in preparation) and Four (Roemer et al., 2021c) have shown that MBIs are positively related to higher levels of well-being and lower levels of distress. MBIs aim to enhance various mindfulness-related capacities. Psychometrically, these capacities are often assessed with the FFMQ, which measures one's ability to observe internal and external stimuli, describe internal experiences, be nonreactional and nonjudgmental concerning feelings and thoughts, and one's ability to act with awareness in the present moment (Baer et al., 2006). Previous research has shown that different mindfulness facets relate to well-being and distress (Bergin & Pakenham, 2016; Cash & Whittingham, 2010; Medvedev et al., 2018), but existing research often fails to employ a research design and statistical procedures that allow the identification of the extent to which mindfulness facets contribute differentially to well-

being and distress. The final study of this thesis aimed at examining these relationships.

Study Five (Roemer et al., 2021d) suggests that the Nonreacting facet of the FFMQ is the strongest predictor of well-being, explaining 25% of its variance, while Describing is the second strongest predictor explaining 9% in well-being. Acting with awareness on the other hand is the strongest inverse predictor of distress, explaining 20% of its variance, with Nonreacting being the second strongest inverse predictor explaining 7% in distress. These results show that mindfulness is able to enhance well-being as well as reduce distress, but that different capacities seem to be of importance in these relationships. This thesis found that mindfulness capacities differ in their contribution to well-being and distress, which is consistent with existing literature (Cash & Whittingham, 2010; Medvedev et al., 2018; Short et al., 2016), but by applying a different research design and statistical analysis than previous research, this thesis was able to rank mindfulness facets according to their importance to well-being and distress simultaneously.

Most MBIs adopt a standard structure, using principles from MBSR that aim at enhancing mindfulness by training to use different mindfulness capacities (Baer et al., 2004; Jamieson & Tuckey, 2017) and findings in this thesis indicate that a more nuanced training approach in MBIs could be beneficial. This aligns with suggestions by Baer et al. (2004), who say that assessment of different mindfulness facets may help mindfulness practitioners to teach and develop mindfulness in participants. For instance, if a participant scores highly on the Describing and Observing facets, but not on the Nonreacting facet, this would be an area to work on with the participant to help enhance well-being. Moreover, knowledge of how facets relate to well-being and distress may help to improve mindfulness development in the future targeting the individual needs of participants. For example, participants who do not suffer from clinical symptoms but just want to further enhance well-being, could be advised to specifically work on the

development of the Nonreacting facet. Distressed participants who want to alleviate distress levels in contrast could be advised to focus more on acting with awareness.

In summary, these studies found that low-dose MBIs can contribute to enhanced well-being and reduced distress and might protect from performance deterioration in times of demanding training. However, it was shown that not all individuals benefit equally from MBIs, which may have implications for further training and research in the future. MBIs aim to enhance different mindfulness capacities, but it was found that the various mindfulness facets contribute differentially to well-being and distress. This knowledge may help to improve MBIs in the future.

Theoretical Implications

This thesis made several contributions towards the understanding of the potential and limits of mindfulness and MBIs by investigating the benefits of mindfulness in different training and work contexts. This section discusses the theoretical contributions of this thesis, elaborating on the potential causes of findings and how they influence our understanding of mindfulness.

Firstly, it was found that mindfulness may buffer the negative effect of inauthenticity on depression (Roemer et al., 2021a). While it was found lower levels of authenticity are associated with higher levels of depression, this relationship was weakened by higher levels of mindfulness. The mechanism of this relationship could be rooted in the nonjudgmental and accepting attitude of mindful individuals. For example, mindful individuals have a high level of awareness of their actions and perceptions, are able to be nonjudgmental of thoughts and feelings and can just let them come and go without being carried away by them (Baer et al., 2008). This could mean that highly mindful individuals who are aware of their inauthenticity, are accepting of the fact and do not judge their behaviour. They might be able to just see it as what it is: a necessity or pragmatic behaviour due to expectations in the workplace.

Furthermore, previous research showed that inauthenticity is related to higher levels of rumination (Borawski, 2019), which involve passively and repetitively focusing on negative emotions (Deyo et al., 2009). Mindfulness has been found to be negatively associated with rumination and associated depressive symptoms (Deyo et al., 2009). It is therefore plausible that more mindful individuals can manage ruminative thoughts that arise due to feelings of inauthenticity and thus feel less depressed. Authenticity and mindfulness exhibited a strong positive correlation in this thesis ($r=.63, p<.01$). This raises the question whether authenticity and mindfulness may actually represent subcomponents of the same construct. This means that authenticity and mindfulness could form part of a construct measuring overall awareness that involves awareness to the present moment as well as awareness of oneself. If that is the case, it could advance our understanding of how attention to the present as well as knowledge of ourselves together contribute to a healthy life.

Secondly, it was found that mindfulness is positively related to change readiness, but only when levels of well-being are high and levels of distress low (Roemer et al., 2021b). Mindfulness is known to be associated with self-regulatory behaviour (Brown & Ryan, 2003), and self-regulation could play an important part when dealing with change at work (Kuntz & Gomes, 2012). However, research suggests that employees' abilities to self-regulate are limited. Stressed employees show poorer performance in tasks that require self-regulation compared to non-stressed employees due to increased fatigue (Chan & Wan, 2012). This implies that while mindfulness may be beneficial for healthy employees, distressed and fatigued employees may not be able to benefit from mindfulness when dealing with change. Moreover, workplace pressure, such as the expectation to commit to change, can be interpreted as a challenge or a threat. While threat appraisal compromises self-regulation, challenge appraisal leads to more engagement (Mitchell et al., 2019). It is plausible that the employees' state of

mind may trigger different forms of appraisal. While healthy employees may regard change as a challenge, distressed employees may see change as a threat, which may impair self-regulation and impact change readiness.

Thirdly, it was found that a low-dose MBI had delayed effects on the well-being of Navy Junior Officers (Roemer et al., in preparation). Mindfulness enables individuals to appraise future situations in a non-threatening manner, which may contribute to higher levels of well-being at future time points (Weinstein et al., 2009). In addition to that, the integration of mindfulness in the participants' lives requires time, which may also contribute to delayed well-being effects (van de Weijer-Bergsma et al., 2014). This implies that mindfulness practice and MBIs should be part of one's daily life to show prolonged effects.

Fourthly, this thesis answers the call of organisational psychology scholars for research that investigates whether mindfulness is good for everyone and whether individual differences have an influence on the effectiveness of mindfulness training (Hyland et al., 2015). This thesis showed that a very short MBI with only four hours of contact time can produce positive post-intervention effects on levels of distress in young adults undergoing employability-related training, but effectiveness was dependent on the participants' baseline levels of mindfulness and well-being (Roemer et al., 2021c).

There are multiple explanations for these effects, for instance, Shapiro et al. (2011) suggest that more mindful participants could find it easier to practise mindfulness or feel more comfortable with mindfulness practice than less mindful individuals, which could explain positive intervention effects. Moreover, mindful participants might have been less judgmental and more open to the MBI: mindfulness has been linked to reduced motivated perception, which makes it less likely that perceptions are influenced by existing expectations (Adair & Fredrickson, 2015). In addition, it is known that mindfulness is related to better attention and working memory

(Moore & Malinowski, 2009; Ruocco & Wonders, 2013), which could mean that more mindful participants were better able to process the content of the MBI. These theoretical implications help to understand how mindfulness can possibly enhance and moderate intervention outcomes.

Those findings imply that if researchers controlled for individual differences at baseline in their intervention studies, they might find that some individuals benefit significantly more than others. Studies analysing MBIs in other fields of psychology, such as clinical and educational psychology, have already started to consider psychological states and traits at baseline to evaluate intervention effects (Arch & Ayers, 2013; Fung et al., 2019; Nyklíček & Irrmischer, 2017; Shapiro et al., 2011), and the field of organisational psychology has just started recently to follow this approach (Krick & Felfe, 2020). This is certainly a step in the right direction in order to establish who actually benefits from MBIs in organisational contexts.

Fifthly, an additional theoretical contribution emerges from the finding that certain mindfulness capacities have a bigger impact on well-being and distress than others. While MBIs aim to target all capacities, Nonreacting and Acting with awareness seem to play a particularly important role when it comes to well-being and distress (Roemer et al., 2021d). Nonreacting can be seen as a way to implement acceptance to internal experiences while refraining from reacting to them impulsively (Baer et al., 2006), which could explain the positive relationship to well-being. Moreover, Nonreacting was found to relate to positive affect. Positive affect in turn was associated with higher levels of self-efficacy, optimism, resilience and hope (Malinowski & Lim, 2015). Those four constructs form part of psychological capital, which has repeatedly been shown to result in higher levels of well-being (Luthans et al., 2015). The strong positive relationship of Nonreacting and well-being could therefore be explained through positive affective experiences that facilitate the access of valuable

psychological resources. The negative relationship between Acting with awareness and distress on the other hand, could be explained through enhanced self-regulation (Short et al., 2016). Acting with awareness involves paying full attention to the present moment and the tasks one engages with (Baer et al., 2006). This heightened level of awareness and attention may enable one to detect dysfunctional behaviour, which may then be adjusted accordingly.

Overall, this thesis' findings contributed to a better understanding of mindfulness and MBIs. It was found that mindfulness can help to reduce negative and enhance positive outcomes in the workplace. However, it was found that mindfulness only benefitted those that were in a mentally healthy condition and MBIs were only effective for those that were mindful and healthy from the beginning. Moreover, mindfulness capacities targeted by MBIs seem to contribute differently to well-being and distress, which enhances knowledge of why mindfulness may help to improve mental health. Overall, this section explored theoretical explanations of these findings, contributing to our understanding of mindfulness and effectiveness of MBIs.

Practical Implications

The results of the research studies presented in this thesis have important implications for organisations who aim to use mindfulness to support employee mental health, facilitate change or protect from performance decline in times of stress. Firstly, findings presented in this thesis suggest that higher levels of mindfulness may protect from the negative mental health impact of inauthenticity. Consequently, an implication for organisations is to provide mindfulness training alongside efforts to improve employee authenticity to help employees to be accepting and nonjudgmental of their feelings and thoughts that may arise when inauthentic behaviour is required by the job. This could therefore help to enhance mental health. Organisations also need to acknowledge that employees who can be their authentic selves in the workplace are

likely to have better mental health. Encouraging employee authenticity may therefore be beneficial and could even be promoted through interventions that are similar to authentic leadership interventions where participants get the chance to engage in self-exploration and identification of their values (Baron, 2012).

Secondly, organisations who are going through change could consider mindfulness training to enhance employee readiness for change. Findings from this thesis have shown that more mindful employees are more likely to show higher readiness for change. An important caveat is that this only applies to employees who do not suffer from low levels of well-being and high levels of distress, which implies that the employees' mental health is also important when it comes to getting them ready for change. While findings in this thesis show that mindfulness may help employees to deal with organisational change if their mental health is not already compromised, it may not be appropriate for employees who struggle with impaired mental health. This implies that organisations have to identify factors in the organisation that may be the root of poor mental health and address them separately before expecting mindfulness interventions to enhance organisational outcomes.

This adds to the discussion concerning the appropriate use of mindfulness interventions in business environments. Scholars are concerned that organisations use mindfulness as a quick way to target multiple issues, such as productivity and well-being, without addressing structural problems in the organisation, which would also contradict the nature of mindfulness (Hülshager, 2015; Hyland, 2015). Mindfulness should obviously not be regarded as a cure for all organisational problems that concern employees. Furthermore, organisations and employees should regard MBIs as an opportunity to start the practice and implementation of mindfulness in daily life. This means that MBIs are not meant to fix problems but are rather supposed to help with the long-term integration of mindfulness and its fundamental principles at work and in life.

This could mean that organisations have to think about how an organisational climate can be created that encourages mindfulness (Hülshager, 2015; Hyland, 2015).

Thirdly, previous research has shown that employees undergoing demanding training or tasks at work may experience impaired attentional performance and increases in mind wandering (Jha et al., 2015). Findings from this thesis suggest that mindfulness training may protect from attentional performance decline in Junior Officers of the Royal New Zealand Navy. It may therefore be valuable for organisations to offer mindfulness training to employees who work in stressful conditions and where mind wandering and attentional lapses in performance could have negative consequences. This is the case for employees in the military, but also in aviation or health care, where it is essential to keep attention to the task on hand and quickly respond to any conditions that may require a reaction and change in behaviour.

Fourthly, this thesis found that low-dose MBIs do not work equally for everyone, which has important implications for organisations who want to offer MBIs to promote mental health. More specifically, a low-dose MBI is only effective for participants who have higher levels of mindfulness and well-being prior to the start of the intervention. It may therefore be useful to assess levels of mindfulness and well-being of potential participants before allocation to an intervention. Individuals that have lower levels of mindfulness and well-being may not benefit from a low-dose MBI. For these individuals it may be better to assign them to a longer intervention format to make sure they reap the anticipated benefits. An implication for the field of organisational psychology would therefore be to control for psychological factors that may impact the effectiveness of MBIs, as knowledge gained from this can help managers and human resource professionals to make more effective decisions when it comes to training and development of their trainees and employees.

Lastly, findings from this thesis provide evidence that the different mindfulness

capacities that MBIs aim to enhance relate differently to mental health outcomes such as well-being and distress. Mindfulness instructors and practitioners could assess the development of those capacities in participants during the course of the intervention and specifically target those capacities that relate strongly to targeted outcomes. For example, if a participant's main motivation is to enhance levels of well-being, it may be valuable to assess and develop mindfulness capacities that have shown to strongly relate to levels of well-being, such as practising to not react to internal thoughts and feelings when they arise. This could help participants to increase positive affect and coping through better access to psychological resources (Malinowski & Lim, 2015). If a participant's main motivation is to decrease levels of distress on the other hand, it may help to focus on mindfulness capacities that are negatively related to distress, such as acting with awareness in everyday life. Acting with awareness can aid self-regulation (Short et al., 2016) which in turn could assist coping and reflecting on distress levels. This finding implies that it may be valuable to continuously assess the development of mindfulness capacities in MBIs to be able to target weaknesses and promote positive outcomes. This had previously been suggested by Baer et al., (2004), but a real integration of this approach in MBIs is not well documented in the literature. Findings from this thesis suggest that this may be worth considering when conducting MBIs.

In summary, this thesis provides a number of practical implications for organisations and mindfulness instructors alike. Mindfulness has a clear potential to enhance mental health, deal with organisational change and to protect from attentional performance decline. However, the application and power of mindfulness and low-dose MBIs also has its limits, showing that it may not work in all conditions and for all people equally. Mindfulness may only help mentally healthy employees to deal with organisational change. Furthermore, low-dose MBIs may be suitable to enhance mental health in individuals that have initially higher levels of mindfulness and well-being.

Limitations

Studying mindfulness in the work context and evaluating the effectiveness of MBIs is a complex undertaking. While these studies were carefully designed and efforts were made to recruit a sufficient number of participants, there are a few aspects that limit the generalisability of findings. This section aims to acknowledge the limitations of the studies carried out in this thesis.

Studies One (Roemer et al., 2021a) and Two (Roemer et al., 2021b) recruited a large number of employees ($n=301$), but a major limitation of these two studies with regards to practical implications is that they analysed cross-sectional data. This means that causal conclusions are invalid and only speculative. While mindfulness has a negative association with depression and a positive association with readiness for change, experimental intervention studies are needed to investigate whether mindfulness and MBIs indeed facilitate dealing with the effects of inauthenticity and organisational change.

Study Three (Roemer et al., in preparation) investigated whether a low-dose MBI can protect from attentional performance decline and enhance well-being in times of demanding occupational training. While results suggest that this may be the case, a major weakness of this study is the small sample size ($n=24$) and even though an appropriate non-parametric statistical test was chosen to carry out the analysis, this study lacks statistical power. The small sample size may be the reason why the changes in magnitude of correlations were not found statistically significant even though changes seem large. Moreover, the study lacks a control group from the same military cohort to analyse whether delayed intervention effects of well-being can be attributed to the MBI or whether they are a product of changes in the military environment. This study should be seen as a test of concept or pilot and its practical implications should therefore be interpreted with a word of caution.

Study Four (Roemer et al., 2021c) evaluated the effectiveness of a low-dose MBI on distress levels with a statistically appropriate sample of young unemployed adults ($n=239$) that were evenly assigned to an intervention and a control group. Even though this study was carefully designed and evaluated, there are some factors that were not controlled for and leave open questions. It was found that more mindful participants benefitted from the intervention, however, it is not known whether this relationship was also confounded with more practice time outside contact sessions. Participants were encouraged to practice mindfulness outside classes, however, out-of-class practice time was not captured and controlled for. In addition to that, the sample consisted of unemployed individuals and while results are promising, it remains questionable whether those can be generalised to other populations.

Study Five (Roemer et al., 2021d) found that different mindfulness facets related differently to levels of well-being and distress. While these findings seem to be interesting and raise the question whether mindfulness interventions can be tailored specifically to the needs of participants, it is questionable whether findings from a cross-sectional study can have valid implications for interventions. Investigating whether certain mindfulness capacities can be specifically targeted in interventions to optimise outcomes should therefore be investigated in more detail in an experimental intervention study.

Future Research Directions

Based on the findings and limitations of the studies in this thesis, there are several directions for future research that aim to expand the knowledge on the potential and limits of mindfulness and MBIs. A major limitation of the studies conducted in the workplace was the lack of a longitudinal and true experimental design. Future research should therefore investigate with longitudinal and experimental intervention studies whether mindfulness interventions can help to deal with challenges in the workplace,

such as feelings of inauthenticity and organisational change.

A significant concern in Study One (Roemer et al., 2021a) is the neglect of cultural influence on the measurement of study variables. It was recently shown that collectivism could weaken the positive relationship between authenticity and well-being (Sutton, 2020). More than twenty percent of the sample indicated an ethnicity that is likely to be more collectivistic than individualistic and the analysis did not account for that. Previous research indicated that authenticity may play a bigger part in the relationship between mindfulness and well-being for participants from a collectivistic culture than for participants from an individualistic culture (Chen & Murphy, 2019). However, future research has to address the question whether the construct of authenticity itself may be perceived or defined differently depending on whether one is from a collectivistic or individualistic culture.

Similarly, the measurement of depression in collectivistic cultures should also be investigated more closely. Research indicates that depression may have different triggers in individualistic and collectivistic cultures, with levels of personal self-efficacy more strongly negatively related to depression in individualistic samples (Chen et al., 2006), which could also have implications regarding the relationship of authenticity and depression. This means that researchers should make an effort to understand how the application of measures validated in individualistic cultures could bias results in collectivistic samples. This implies that culturally appropriate measurement of authenticity and depression should be used to investigate their relationship in more detail.

Moreover, given the strong correlation of authenticity with mindfulness, future research should investigate whether authenticity and mindfulness are subcomponents of the same construct. Future research could investigate reliability and validity of such an overarching awareness construct by factor analysing the FFMQ and measures of

authenticity. This could possibly lead to the development of a measure that not only measures awareness of inner and outer experiences, but also of the self. Such a measure could be used in future research to advance our understanding of how awareness of our experiences and our self together contribute to mental health.

Longitudinal studies are particularly needed in the context of organisational change. Literature suggests that affective, behavioural and cognitive readiness for change may not occur at the same point in time and might even contradict at some stages (Bouckenhooghe et al., 2009; Piderit, 2000). It would therefore be valuable to assess readiness for change over an extended period while change in the organisation unfolds. This would not only allow analysis of the development of change readiness over time, it would also enable analysis of whether mindfulness relates more strongly to one change readiness dimension than another and how it may facilitate commitment to change. It is possible for instance, that a mindful employee does not feel good about a change project and thus shows low affective change readiness but shows high levels of cognitive change readiness because the employee accepts that there are no viable alternatives to the change. Those employees may therefore be more likely to commit to change even though their affective change readiness is low.

Future research may also further advance our knowledge of the usefulness of MBIs in the context of demanding occupational training. Jha et al. (2015) could show that MBI may protect from attentional performance decline of military service members while undergoing demanding pre-deployment training compared to a group who did not receive an MBI. This thesis investigated whether this effect may also be true for Navy Junior Officers who have just started their career (Roemer et al., in preparation). The small sample size and lack of a control group make it difficult to generalise the findings and clearly attribute them to the intervention. Future research could therefore replicate the study with a larger sample of trainees and include a control group from the same

trainee cohort.

It is further recommended to capture organisational variables that could affect mental health and performance outcomes and also control for adjustment to the work and training environment. High levels of stress while undergoing training is not only common in military personnel (Cigrang et al., 2000), but also in other professions, such as health care. For example, a study found that almost half of radiation oncology trainees in New Zealand and Australia suffer from emotional exhaustion and depersonalisation, which are indicators of burnout (Leung & Rioseco, 2017). Higher levels of burnout are not only concerning in terms of health, but they could also lead to more lapses in attention, which can have fatal consequences in health care professions. It is therefore imperative to further analyse the potential of mindfulness as part of trainee programmes while controlling for work demands and adjustment to those. Drawing from findings of Study Two (Roemer et al., 2021b), mindfulness may not be helpful when mental health is compromised, consequently researchers need to address mental health and performance issues with comprehensive research designs to identify organisational and personal factors that may influence mental health and performance as well as their possible interaction with MBIs.

Furthermore, researchers should consider psychological variables and predispositions that may influence the outcome of MBIs. Shapiro et al. (2011) found that baseline mindfulness had a beneficial effect on outcomes of a standard length MBI and the present study showed that mindfulness and also well-being baseline levels had an impact on the effectiveness of a low-dose MBI (Roemer et al., 2021c). Considering publication bias concerning MBIs (Lomas et al., 2019), it is possible that many mindfulness intervention studies are conducted that do not find significant effects and are thus not published, so we do not know how often MBIs do, in reality, not show effects. Researchers may want to reanalyse existing datasets where they did not find

significant effects and include psychological variables at baseline as covariates/moderators in their analysis. It may appear that those interventions were successful, but only for those with higher baseline levels of mindfulness, mental health or other possible variables.

Similarly, future intervention studies should control for participant characteristics that could impact their effectiveness. Up to this point it is only a speculation that individuals with lower levels of mindfulness and well-being at baseline may need longer interventions. In order to be able to make clear recommendations, it would be valuable if future research addresses this question with suitable research designs. Furthermore, it will be valuable to investigate mediating or moderating variables that explain why higher levels of baseline mindfulness relate to better intervention outcomes. Possible explanations are that mindfulness is associated with better working memory and attention (Moore & Malinowski, 2009; Ruocco & Wonders, 2013), reduced judgment and more objectivity towards the intervention (Adair & Fredrickson, 2015) or that more mindful participants found it easier to practise mindfulness (Shapiro et al., 2011). These explanations sound plausible, but they need to be validated through further research.

Considering this thesis' finding that not all mindfulness capacities contribute to well-being and distress equally (Roemer et al., 2021d), it would be valuable to conduct future studies that investigate whether tailoring MBIs according to the needs of participants makes a significant impact on mental health outcomes. While MBIs aim to target mindfulness capacities as a whole, highlighting the use of nonreacting or acting with awareness in daily life could optimise the effects of MBIs. The cross-sectional nature of the data in this thesis makes it difficult to transfer findings to interventions, therefore experimental studies are needed to further research these relationships. Such studies could compare the effectiveness of a standard MBI and a tailored MBI with

different emphasis on certain capacities depending on the desired outcome. In addition to this, it will be helpful to gain a better understanding of why the capacities of Nonreacting and Acting with awareness relate to higher levels of well-being and lower distress respectively. Future research should therefore investigate potential mediators in this relationship. Short et al. (2016) noted that Acting with awareness is related to self-regulation and Malinowski and Lim (2015) showed that Nonreacting relates to positive affect. A more comprehensive knowledge of such relationships with other psychological processes and capacities may contribute to the further development of interventions to make them more effective.

Conclusions

The aim of this thesis was to examine the potential and limits of mindfulness. The application of mindfulness in organisational contexts has become increasingly popular among researchers and practitioners alike, but little is known about *when* and *for whom* MBIs are most effective. In the light of the various challenges and demands employees face today, this thesis set out to explore whether mindfulness may be helpful to deal with those and whether low-dose MBIs work for everyone equally well.

This thesis began to examine the potential of mindfulness in the face of prominent challenges in the workplace: feelings of inauthenticity and becoming ready for organisational change. Mindfulness indeed proved to be beneficial to buffer the negative impact of inauthenticity on mental health and it was shown to be positively associated with readiness for change, but only for those whose mental health is not impaired. The finding that mindfulness facilitates readiness for change added to the so far only theoretical discussions (Gärtner et al., 2013, Gondo et al., 2013) of mindfulness' role regarding employee change readiness. Moreover, findings that mindfulness only helps change readiness when mental health is not impaired, contributed to the discussion concerning the appropriate use of mindfulness in business

(Hülshager, 2015; Hyland, 2015). After having found that mindfulness has benefits in the workplace, this thesis investigated the effectiveness of two low-dose MBIs on well-being, distress and attentional performance. While one study showed that a low-dose MBI can protect from attentional performance decline and has delayed positive well-being effects, the other study found that a low-dose MBI can reduce levels of distress for those that were more mindful and healthy prior to the intervention. This finding contributed to the knowledge of moderating variables that influence the effectiveness of MBIs, which had been demanded by organisational scholars (Hyland et al., 2015) and had only been addressed by a few in mostly clinical and educational settings (Fung et al., 2019; Nyklíček & Irmischer, 2017; Shapiro et al., 2011).

Lastly, the thesis explored how the different capacities which MBIs aim to enhance relate to distress and well-being. Mindfulness is positively related to well-being and negatively related to distress but, taking into account that previous research had shown mindfulness facets may relate differently to different outcomes (Cash & Whittingham, 2010; Medvedev et al., 2018), this thesis analysed the differential contribution of mindfulness facets with appropriate methods. It was found that Nonreacting is the most important predictor of well-being, while Acting with awareness is the most important inverse predictor of distress. This knowledge can possibly help to optimise MBIs in the future.

To conclude, mindfulness and low-dose MBIs are indeed beneficial in the workplace. However, the use of low-dose MBIs should be carefully considered by establishing who may benefit from such an intervention format and who may need longer MBIs or other interventions to address their needs. Organisations are encouraged to provide mindfulness training in the workplace and allocate employees to the right intervention format depending on their dispositional mindfulness and mental health. Low-dose MBIs can be regarded as a way to start being more mindful and organisations

should make it part of their culture rather than seeing it as a quick fix to see sustained effects. Researchers are provided with directions for future research to further investigate the potential and limits of mindfulness and MBIs in training and workplace settings, such as more experimental research to validate moderating effects of psychological factors in MBIs of different lengths.

Overall, this thesis has identified both the potential and limitations of mindfulness at work. It found that mindfulness can indeed be beneficial for employees who have to deal with inauthenticity and change in the workplace and that low-dose MBIs are effective in improving mental health. However, MBIs are not universally effective and may be most suited to those who are initially more mindful and mentally healthy.

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Appendix: Publication Co-Authorship Forms



Co-Authorship Form

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Chapter 2, study 1

Roemer, A., Sutton, A., & Medvedev, O. N. (2021). Mindfulness buffers the effect of inauthenticity on depression. *Psychological Reports*. Online First. <https://doi.org/10.1177/00332941211012941>

Nature of contribution by PhD candidate

Anja Roemer developed the research question, designed the study and conducted data analyses in collaboration with the co-authors. AR collected data, was responsible for data cleaning and conducted the full literature review. The full manuscript was drafted by AR and further refined with feedback from co-authors.

Extent of contribution by PhD candidate (%)

85%

CO-AUTHORS

Name	Nature of Contribution
Anna Sutton	collaborated with study design, advised on statistical analyses and editing of the manuscript
Oleg N. Medvedev	collaborated with study design, advised on statistical analyses and editing the manuscript

Certification by Co-Authors

The undersigned hereby certify that:

- ❖ the above statement correctly reflects the nature and extent of the PhD candidate's contribution to this work, and the nature of the contribution of each of the co-authors; and

Name	Signature	Date
Anna Sutton		28/04/2021
Oleg N. Medvedev		29/04/2021



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Chapter 3, Study 2

Roemer, A., Sutton, A., & Medvedev, O. N. (2021). The role of dispositional mindfulness in employee readiness for change during the COVID-19 pandemic. *Journal of Organizational Change Management*. Online First. <https://doi.org/10.1108/JOCM-10-2020-0323>

Nature of contribution by PhD candidate

Anja Roemer developed the research question, collected data, was responsible for data cleaning and conducted the full literature review and data analyses in cooperation with co-authors. The full manuscript was drafted by Anja and further refined with feedback from co-authors.

Extent of contribution by PhD candidate (%)

85%

CO-AUTHORS

Name	Nature of Contribution
Anna Sutton	collaborated with study design, advised on statistical analyses and editing of the manuscript
Oleg N. Medvedev	collaborated with study design, advised on statistical analyses and editing of the manuscript

Certification by Co-Authors

The undersigned hereby certify that:

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Chapter 4, Study 3

Roemer, A., Sutton, A., Grimm, C., Kimber, S., & Medvedev, O. N. (2021). Impact of a low-dose mindfulness-based intervention on attentional performance and well-being in Navy Junior Officers. *Manuscript to be submitted.*

Nature of contribution
by PhD candidate

Anja Roemer developed the research design in collaboration with co-authors, was responsible for data entry, data cleaning and conducted the full literature review. Data analysis was conducted with advice from co-authors. The full manuscript was drafted by Anja and further refined with feedback from co-authors.

Extent of contribution
by PhD candidate (%)

70%

CO-AUTHORS

Name	Nature of Contribution
Anna Sutton	collaborated with the design, data analyses, writing, editing of the manuscript
Carsten Grimm	collaborated with the design, the data collection and edited the manuscript.
Stafford Kimber	collaborated with the design, the data collection and edited the manuscript.
Oleg N. Medvedev	collaborated with the data analyses, writing and editing the manuscript

Certification by Co-Authors

The undersigned hereby certify that:

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Chapter 5, study 4

Roemer, A., Sutton, A., Grimm, C., & Medvedev, O. N. (2021). Effectiveness of a low-dose mindfulness-based intervention for alleviating distress in young unemployed adults. *Stress and Health*, 37(2), 320-328.
<https://doi.org/10.1002/smi.2997>

Nature of contribution
by PhD candidate

Anja Roemer developed the research question in collaboration with co-authors, was responsible for data entry, data cleaning and conducted the full literature review. Data analysis was conducted with advice from co-authors. The full manuscript was drafted by Anja and further refined with feedback from co-authors.

Extent of contribution
by PhD candidate (%)

70%

CO-AUTHORS

Name	Nature of Contribution
Anna Sutton	collaborated with writing and editing of the manuscript
Carsten Grimm	collaborated with the design, the data collection and edited the manuscript.
Oleg N. Medvedev	collaborated with the data analyses, writing and editing the manuscript

Certification by Co-Authors

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Anna Sutton		28/04/2021
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Chapter 6, study 5

Roemer, A., Sutton, A., Grimm, C., & Medvedev, O. N. (2021). Differential contribution of the five facets of mindfulness to well-being and psychological distress. *Mindfulness*, 12, 693-700.
<https://doi.org/10.1007/s12671-020-01535-y>

Nature of contribution
by PhD candidate

Anja Roemer developed the research question in collaboration with co-authors, was responsible for data entry, data cleaning and conducted the full literature review. Data analysis was conducted with advice from co-authors. The full manuscript was drafted by Anja and further refined with feedback from co-authors.

Extent of contribution
by PhD candidate (%)

70%

CO-AUTHORS

Name	Nature of Contribution
Anna Sutton	collaborated with writing and editing of the manuscript
Carsten Grimm	collaborated with the design, the data collection and edited the manuscript.
Oleg N. Medvedev	collaborated with the data analyses, writing and editing the manuscript

Certification by Co-Authors

The undersigned hereby certify that:

- ❖ the above statement correctly reflects the nature and extent of the PhD candidate's contribution to this work, and the nature of the contribution of each of the co-authors; and

Name	Signature	Date
Anna Sutton		28.04.2021
Carsten Grimm		04.05.2021
Oleg N. Medvedev		29.04.2021